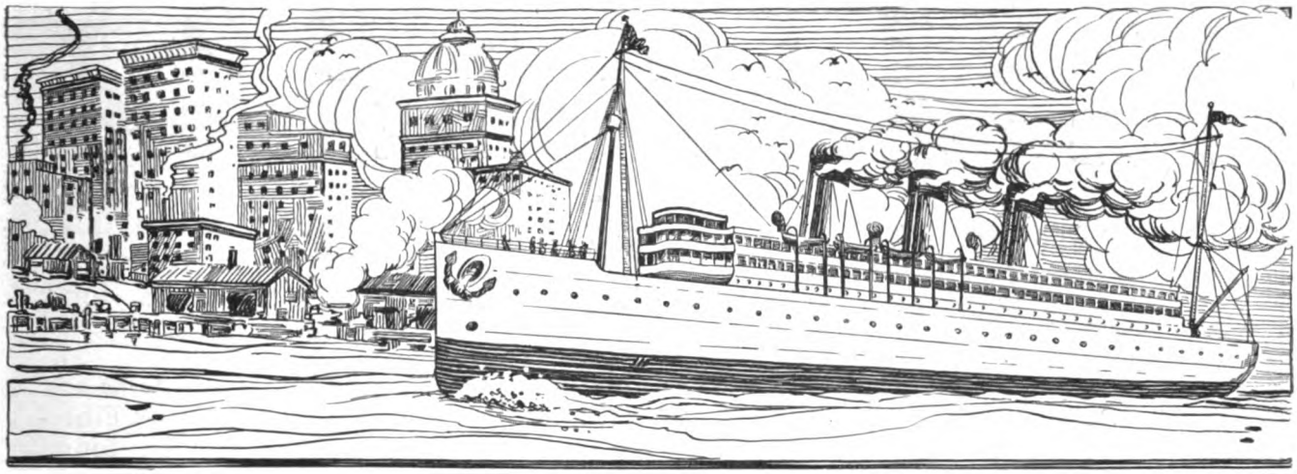

CLEVELAND—NEW YORK, FEBRUARY, 1916

THE MARINE REVIEW

A Monthly Publication Devoted to Shipbuilding, Marine Engineering and the Business of Transportation by Water.

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THE MARINE REVIEW

VOL. 46 CLEVELAND FEBRUARY, 1916 NEW YORK No. 2

Keep Old Glory on the High Seas

The Year Recently Closed Witnessed the Recrudescence of the American Merchant Marine—The Problem of the Future is to Prevent a Relapse to Former Conditions

BY THIS TIME the administration appears to have come to the conclusion that its ill-starred ship purchase bill cannot be jammed through congress without extensive modification; accordingly, the legislative salvage corps is busy with amendments and revisions intended to revivify this all but defunct measure. This work will bear watching. So far it appears that the amendments consist, not in essential modifications, but in the addition of riders, which, it is hoped, will lend sufficient strength to get the main proposition through. For instance, it is proposed to create a shipping board—a sort of twin brother to the interstate commerce commission—to watch over the destinies of the American merchant marine *and* to operate government-owned ships. Of course, there will be plenty of places on the proposed board for cabinet members, all of whom undoubtedly are experts on marine affairs.

Expert Political Juggling

Now the shipping board proposition *per se* has merit; the idea has been endorsed by leading ship owners, traffic associations and chambers of commerce. But a properly constituted board would have its hands full without attempting to direct a government-owned steamship corporation. Any attempt to tack shipping board legislation onto the government ownership bill brands itself as political jockeying and nothing else.

Fortunately, while leaders at Washington are enmeshed in the toils of partisan politics, the American merchant is forging ahead. The unusually complete statistics published in this issue show that 37 large steamships were launched during 1915 by coast and lake yards and that at the close of the year 168 vessels were under construction. This record is unparalleled in American history, and should be a source of gratification to every patriotic citizen. The stars and stripes float over more tonnage than any other ensign, except the union jack. Within the past six months, also, our pitiful showing in foreign trade has improved mightily and American merchant ships are now familiar sights in all the important harbors of the world. Furthermore, the new years opens with conditions unusually propitious for continued progress toward maritime independence.

From the Corn Tassels to the Sea

The public is at last alive to the importance of the merchant marine problem and this awakening alone is of tremendous significance. On the coasts, the gravity of the situation has been appreciated for years, but in the interior, where the corn grows high, there has been little understanding of the connection between the American flag on the high seas and a new six-cylinder buzz wagon for Silas Jones. All this is now changed and Iowa wants a merchant marine as badly as Massachusetts. During the past six months the merchant marine question has become truly a national issue. It is realized that ships are needed not only to carry our goods across the seas, but to form an auxiliary to the navy.

The immediate future, therefore, is secure. But what of the long look ahead; what of conditions when the war is over and the merchant fleets of all nations again ply the seas unhindered? Here, it cannot be denied, lies cause for apprehension. The ultimate fate of American shipping lies in the hands of the government and up to date, it must be confessed, this agency has shown little disposition to adopt policies favorable to permanent development.

A Wide Awake Navigator Wanted

Washington sees only the needs of the hour and sets out to remedy a purely temporary shortage in tonnage by means of a wierd experiment in government ownership. Meanwhile the ultimate success of the American merchant marine hangs in the balance. The occasion demands a clearly defined, long-run policy; temporary expedients have no place in the situation. The careful navigator looks more than a ship's length ahead.

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A New American Merchant Marine

The Romantic Story of a Year's Progress in Ship Building in American Coast Yards—Over 120 Vessels Under Construction

By C. J. Stark

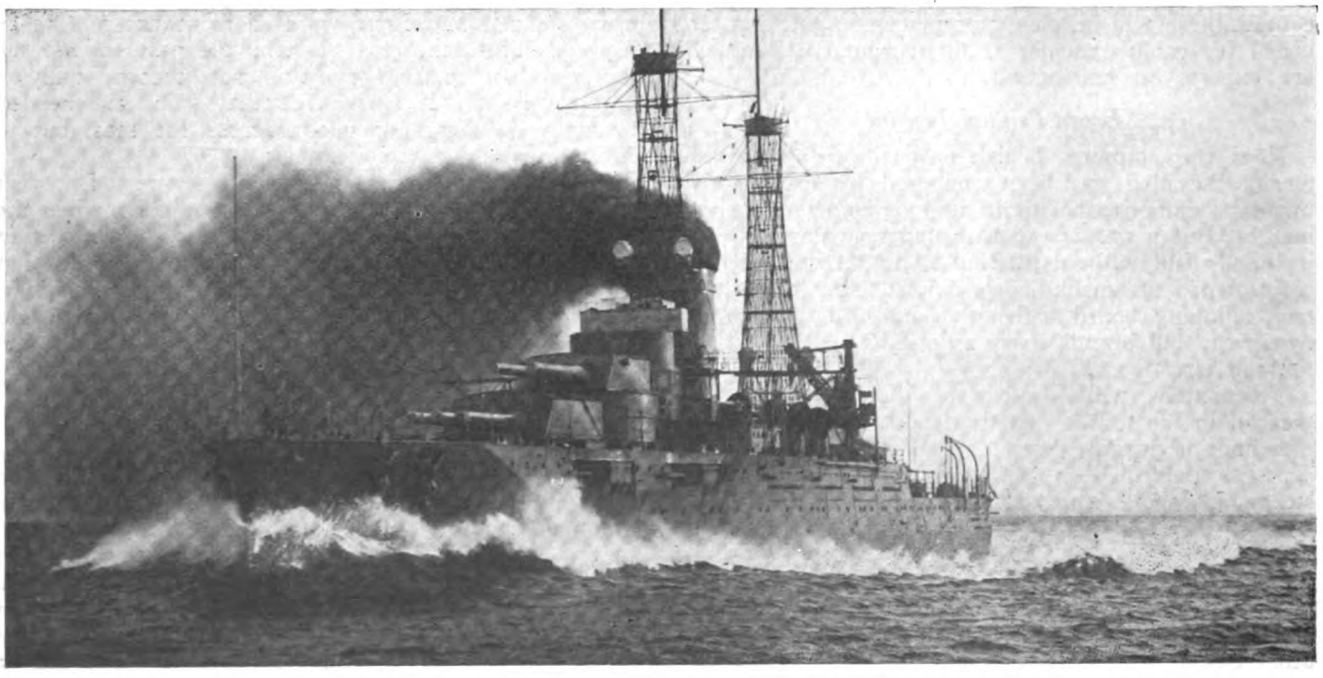
AMERICAN ship building for the high seas, for years decadent and neglected, made a fresh start in 1915. It quite surpassed itself by the tremendous vigor it developed. It established a dignity of magnitude and importance comparable with its traditional greatness of years long past, when the American flag, borne by American-built and American-manned craft, was familiar in every sea where trade or commerce flourished.

Modern ship building in the United States can show nothing to approach the record established during the year 1915. In their number and tonnage, the vessels ordered represent a tidy commercial fleet in themselves, a business asset that any nation might well be proud to possess. Approximately 120 merchant craft of the sea-going class, with an aggregate tonnage of more than 500,000, are actually under construction or entered on the order books of our builders. A year ago, the list of new merchant vessels on the ways did not exceed a dozen. Practically all the tremendous activity displayed in the upbuilding of a new American merchant marine, accordingly, has fallen within the past 12 months. That the volume of this work, impressive and perhaps significant of a new era in the nation's shipping history was not greater, has been due solely to the fact that all the available capacity has been crowded to the ultimate point. At the present time, any additional contracts accepted by the yards call for a delivery in from 18 months to two years. It is estimated that there are a score or more of vessels in the market at the present time, for which the owners are maneuvering to obtain the best possible delivery. That all of these contracts will be placed in due season, is confidently expected. The heavily engaged position of the coast ship yards for months ahead, has caused new work to overflow to lake plants. A number of contracts for ocean-going craft have been placed with ship builders at Detroit, Toledo, Cleveland and other yards at fresh-water points.

The Ever Widening Circle

The rejuvenation of ship building in this country has impressed its effects upon other industries beyond itself. The iron and steel trade has profited hugely from this unparalleled recovery. If the total finally could be cast up, it probably would be found that the orders for ocean-going merchant boats, alone, called for not less than 350,000 to 400,000 tons of steel. Ship builders, especially those who were enlarging or opening new yards at the close of the year, were finding great difficulty in obtaining desired deliveries on steel. The great demand for ship plates has been one of the contributing causes for the strong market in this product which brought about the payment of premium prices over other heavy materials. It is manifest, therefore, that the maintenance of an active era of construction in home shipbuilding is of primary importance to every industry in the country making for greater stability and strength in the home market.

In large part, the vessels ordered during the past year are for American steamship and industrial companies engaged in the coastwise trade or in the commerce with other countries of the western hemisphere. In one instance, at least, the owner was an oil company controlled by British capital which is engaged in business between the American coasts. There has been enough of over-seas and foreign tonnage placed, however, to give the traffic



THE BATTLESHIP NEVADA, BUILT BY THE FORE RIVER SHIP BUILDING CORPORATION, ON HER RECENT TRIAL TRIP

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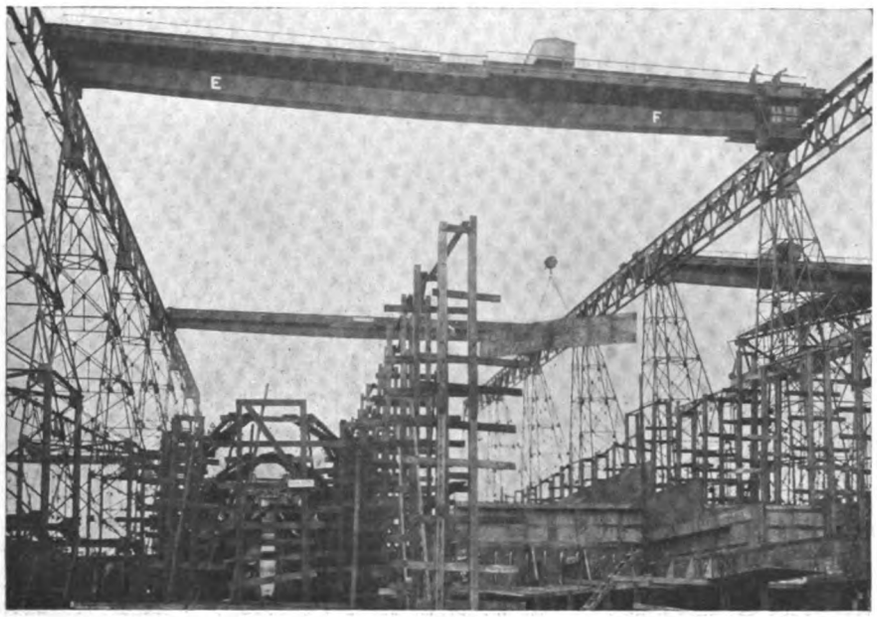
a widely international character. Norwegian shipping interests, unable because of the war to place their work to advantage with European builders, awarded to the American yards perhaps a dozen freight ships. Three of these went to Chester, Pa., others to a Baltimore plant, and several to lake yards. Still others were under negotiation at the beginning of 1916. Tank vessels, principally for the oil trade, have been in extraordinary demand. The number of these awarded or built in 1915 was approximately 45. The Standard Oil Co. was the largest single buyer. This company and its allied interests placed about 25 of these ships. The Clyde Steamship Co., unable to find a berth on the coasts, placed three 2,500-ton ocean boats with the Great Lakes Engineering Works of Detroit. The Toledo Shipbuilding Co., Toledo, took orders for a number of schooners for Atlantic ocean service, while the American Shipbuilding Co., Cleveland, received four or more vessels of Welland canal size from Norwegian transportation companies.

In addition to the large amount of the merchant work during the year, there has been an increase in tonnage demanded for the navy, almost entirely for the United States government. Five battleships—PENNSYLVANIA, MISSISSIPPI, NEVADA, OKLAHOMA and IDAHO—have been under construction during the year. The battleship MORENO for the Argentine republic was completed at the Camden yard. In addition, there have been under construction a number of destroyers, submarines, colliers and miscellaneous craft for the American government. The Argentine republic ordered an oil steamer from the Fore River Shipbuilding Co. and at the same plant, ten submarines were completed for the British government, to be shipped upon the conclusion of the war. The extensive manner in which the capacity of the shipyards now is occupied, undoubtedly, had a considerable measure of influence upon the action of the national administration in awarding the 1916 program of two battleships to government navy yards.

Much Capacity is Added

The natural result of the broad and rapid expansion of shipbuilding in this country in 1916, has been the construction of much new yard capacity and the rehabilitation to accommodate large vessels, of plants long since idle or capable of producing only minor craft. From Bath to Tampa, the Atlantic coast has been visited with a wave of extensions and enlargements which has given the nation the largest industrial potentiality in its history for creating and maintaining a modern navy of commerce. New ways have been built by the Fore River Shipbuilding Co., Quincy, Mass., by the Maryland Steel Co., Sparrows Point, Md., by the Harlan & Hollingsworth Corporation, Wilmington, Del., and by other companies. Cramps at Philadelphia and the New York Shipbuilding Co. at Camden, N. J., have been carrying out important enlargements. The betterments undertaken by the Fore River company have been on a large scale. Apart from the new way, they have included a new plate shop, machine shop, power house, larger crane service and other improvements. The new way at this plant is of the double type, 138 feet wide and 800 feet long, capable of berthing the largest warship. The Chester Shipbuilding Co. acquired the old Roach plant at Chester, Pa., and has remodeled it for the construction of modern vessels. This company has orders for three boats for Norwegian shipping companies. The Standard Shipbuilding Corporation was formed to take over the Townsend & Downey plant on Shooters island, New York harbor, and will specialize in the production of modern steel ships of a limited number of standard types. The Continental Trading Co. was formed and acquired the old Mallory yards at Mystic, Ct. This company now is planning to build two Norwegian vessels. Many other changes of considerable importance have been wrought among Atlantic coast yards, all with the single purpose of constructing larger ships for the ocean-going trade.



SHIP WAYS OF THE FORE RIVER SHIPBUILDING CORPORATION, SHOWING THE NEW GANTRY CRANE SERVICE

What are the underlying causes for this remarkable reversal from struggling existence to independent prosperity that has overtaken the shipbuilders of the country? Whatever they are, it is certain they are not of the making of the United States government, directly speaking. In fact, the great revival has been brought about despite not only the lack of constructive support on the part of the nation's present leaders but also in the face of crippling and obstructive legislation, of which the La Follette seamen's act stands out as a last word of folly. Happily, a set of circumstances beyond the control of the nation or any single set of men, has been the potent factor of the present movement. These have had to do mainly with the great war overseas and are both the direct and indirect consequences that have flowed from the complete readjustment of the world's commerce, attendant upon that conflict. The war has been the predominant influence which has precipitated the present situation; as a secondary and contributing cause, the Panama canal has been important.

Shortage of Tonnage

It is clear that the war has brought about a shortage in the supply of ocean carriers, for the present needs of international trade. So many of the merchant vessels of the belligerent nations, which have included the two great maritime powers of the world, Great Britain and Germany, have been lost to the peaceful pursuits of commerce, by sinking, capture, internment or commandeering for army and navy purposes, that a serious stringency has arisen. Furthermore, British shipyards have been heavily engaged with work for the Admiralty, and have not been able to devote their energies to making up the

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deficiencies in the present tonnage. These conditions have produced an unparalleled rise in transocean freight rates, especially in connection with the enormous export trade with practically all of Europe that has arisen in this country.

Some Fancy Freight Rates

At the present time, the rates being paid from this country to France, to the British Isles, to the Mediterranean and to other parts of the eastern hemisphere, are from six to seven times their normal level. Overseas shipping, consequently, has become most lucrative for the vessel-owner and has attracted into this traffic many ships which heretofore have not engaged in it. A considerable number of American vessels, built primarily for service between coast points, or with near-lying countries, are now engaged in the carrying trade between the United States and Europe at high returns to their owners. Some of the new ships now being built are to take their places in the coastwise trade. Concurrent with the increase of our export trade has come a corresponding broadening of the nation's business between its own coasts, and with South America, Central America, the West Indies, Hawaii and other countries of the western hemisphere. New trade routes have been opened and old ones extended, bringing forth a necessity for American-built ships such as never has existed before.

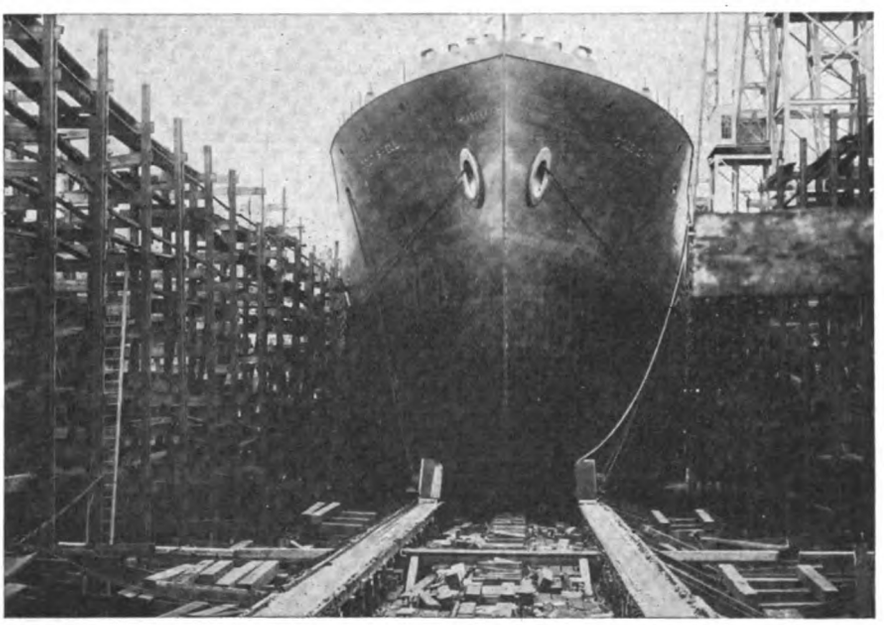
Many of these new enterprises have centered about the Panama canal and the shorter waterway between the coasts has been of tremendous importance in the upbuilding of this commerce. Over and above these new needs for a business navy for American industry, there also has been diverted to the shipyards of this country, considerable tonnage which, if it was to be built at all, had to be done in this country. This applies to ships which in the ordinary course of events, would have been constructed in English, German and other foreign yards.

The added feeling of security of operating these under the American flag for the present, at least, has not been lost sight of.

With the American ship yards assured of capacity operations for two years, at least, by the present work on hand, the question of greatest moment concerns their more extended future. The consensus of opinion among shipping men is, that the answer to this question largely will be determined by the length of the present European war. The longer the conflict endures the stronger position the rejuvenated industry will attain, it is generally believed, and the less likely it will be that what now is being built up can be broken down by a recurrence of conditions such as existed before the war. It is pointed out, moreover, these old conditions are not likely to return when peace is concluded.

The yards of England and Germany are likely to be busily engaged for several years in restoring and repairing naval losses and in replacing the normal depreciation of merchant vessels used in the service of the government. Furthermore, it is not certain when these yards, now in the hands of the government, will be immediately turned back to their private owners. Nor is it likely that the organizations of these plants can be speedily assembled and restored to their former basis of efficiency. Right here appears the factor that the American ship builder is counting upon to work a radical change in his favor, as contrasted with antebellum conditions under which he found it impossible to compete against the European yards. Scarcity of skilled and trained labor and the increased cost of living, due to taxation for the huge war debt, reconstruction, etc., it is thought, are bound to result in high wages abroad; prices for iron and steel products will be on an advanced basis because of much new demand coupled, perhaps, with a reduced production.

A fair chance to compete is all the American shipbuilder asks. That means, obviously, that if he is not to be allowed direct or indirect government aid, he, at least, must not be obstructed at home by federal interference along untried and perilous lines such as has found its expression in the seamen's act, already proven absurdly destructive, and in proposals for government-owned steamships.



LAUNCH OF THE TANK SHIP GOLD SHELL AT THE YARDS OF THE HARLAN & HOLLINGSWORTH CORPORATION, WILMINGTON

A Look Ahead

But, whatever may be the future position of the United States in international marine construction, it seems clear that the demand for ships for our coastwise trade and our commerce with South America, Central America, the West Indies and Hawaii, will be greater than ever before. The manner in which American manufacturers and exporters during the past year and a half, have cemented trade ties and alliances with these countries, points only to that end. That these will be maintained, can be read in the spirit of determination and completeness that has characterized the efforts. In the Panama canal, the nation has an asset and an aid to its coastwise and Latin-American commerce, the importance of which promises to be tremendous. Even before the war, the influence of this gateway between the oceans was beginning to stimulate and stir a new spirit and energy in American ship building.

"Give us four or five years of encouragement and the American ship builder will make himself felt," says the head of a large eastern yard. If the government will do its part, this encouragement will be forthcoming. There are multiplying evidences that among the lessons of the great war, brought home directly to the people of this country, none has been more impressive than the necessity for providing our own merchant marine. As a business proposition, this necessity is immediate; as a defensive measure, to neglect it is simply to gamble with fate.

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Table I.

Vessels Built, Delivered or Launched in 1915

Atlantic Coast Ship Yards

Fore River Shipbuilding Corporation, Quincy, Mass.

Name.	Owner.	Type.	Gross tonnage,	Speed, knots.	Length, Breadth and Depth, feet.	I. H. P.	Date completed.
Texas	Texas Oil Co.	Oil carrier..	6,500	11	431.9 x 56.0 x 32.8	2,700	Dec. .....
New York	Texas Oil Co.	Oil carrier..	6,500	11	431.9 x 56.0 x 32.8	2,700	.....

Harlan & Hollingsworth Corporation, Wilmington, Del.

Silver Shell	Shell Co. of California	Oil Carrier..	5,605	11	427.0 x 53.4 x 31.0	2,700	Dec. 3, '15
Gold Shell	Shell Co. of California	Oil Carrier..	5,605	11	427.0 x 53.4 x 31.0	2,700	Dec. 31, '15
Marion	Bethlehem Steel Co.	Car Ferry..	146	7	113.0 x 22.5 x 7.1	150	June 7, '15
Pyrrhus	Commercial Co.	Oil Barge...	283	....	146.7 x 23.2 x 8.5	.....	Mar. 26, '15
Fort Lee	Riverside & Fort Lee Ferry Co.	Ferry	1,080	....	200.0 x 61.0 x 16.7	1,400	July 22, '15

Maryland Steel Co., Sparrows Point, Md.

Edith	A. H. Bull & Co.	Freight	3,628	....	338	.....	July, 21
Clare	A. H. Bull & Co.	Freight	3,628	....	338	.....	Dec. 28
Munamar	Munson Steamship Line.	Frt. & Pass.	3,800	....	338	.....	Dec. 15
Floridian	American-Hawaiian Steamship Co.	Freight	6,600	....	.....	.....	Dec. 20

Newport News Shipbuilding & Dry Dock Co., Newport News, Va.

Mariana	New York & Porto Rico Steamship Co.	Freight	3,063	....	.....	1,500	.....
Walter D. Noyes..	Crowell & Thurlow Steamship Co.	Freight	4,387	....	.....	1,700	.....
Stephen R. Jones..	Crowell & Thurlow Steamship Co.	Freight	4,387	....	.....	1,700	.....

New York Shipbuilding Co., Camden, N. J.

Gulfcoast	Gulf Refining Co.	Oil carrier..	5,188	....	406.6 x 51.0 x 30.2	2,650	.....
Plymouth	Coastwise Transportation Co.	Collier	5,266	....	395.1 x 55.0 x 34.5	2,500	.....
Franklin	Coastwise Transportation Co.	Collier	5,266	....	395.1 x 55.0 x 34.5	2,500	.....
Virginia	Harby Steamship Co.	Collier	3,289	10½	333.1 x 49.3 x 27.5	1,800	.....
Jonancy	Pocahontas Navigation Co.	Collier	3,289	10½	333.1 x 49.3 x 27.5	1,800	.....
Wm. O'Brien	Carpenter-O'Brien Co.	Lumber	5,483	....	377.5 x 51.0 x 27.0	2,150	.....

Staten Island Shipbuilding Co., Port Richmond, N. Y.

———	Baltimore & Ohio Railroad Co.	Tug	225	....	118	950	.....
———	Magnolia Petroleum Co.	Tug	171	....	100	750	.....
———	Standard Oil Co.	Tug	171	....	100	750	.....

William Cramp & Sons Ship & Engine Building Co., Philadelphia.

Santa Barbara ...	W. R. Grace & Co.	Frt. & Pass.	6,300	....	400	.....	.....

Great Lakes Ship Yards

American Shipbuilding Co., Cleveland.

W. F. White.....	Limestone Transportation Co.	Bulk Frtr...	6,500	13	550.0 x 60.0 x 31.0	2,500	Aug. 31, '15

Great Lakes Engineering Works, Detroit.

International	J. L. Crosthwaite	Freight	1,709	....	256.3 x 43.0 x 19.2	700	.....
Yaque	Clyde Steamship Co.	Freight	1,414	....	259.0 x 38.3 x 18.0	900	.....
Yuna	Clyde Steamship Co.	Freight	1,414	....	259.0 x 38.3 x 18.0	900	.....
Inca	Clyde Steamship Co.	Freight	1,414	....	259.0 x 38.3 x 18.0	900	.....
Morris Adler.....	Morris Adler, Inc.	Freight	2,482	....	262.0 x 43.5 x 27.5	1,350	.....
No. 10	———	Scow	237	....	125.0 x 32.0 x 8.6	.....	.....
No. 11	———	Scow	237	....	125.0 x 32.0 x 8.6	.....	.....
———	Kerbaugh, Inc.	Scow	.....	....	130.0 x 30.0 x 11.8	.....	.....
———	Kerbaugh, Inc.	Scow	.....	....	130.0 x 30.0 x 11.8	.....	.....

Johnston Bros, Ferrysburg, Mich.

Natoma No. 4....	Natomas Co. of California	Dredge	500	....	112	.....	.....
Yuba No. 15.....	Yuba Consolidated Gold Fields Co.	Dredge	800	....	165	.....	.....

Manitowoc Shipbuilding & Dry Dock Co., Manitowoc, Wis.

Nevada	Goodrich Transit Co.	Frt. & Pass.	2,132	....	230.0 x 42.0 x 18.0	1,600	.....

Pacific Coast Ship Yards

Union Iron Works Co., San Francisco.

Annette Rolph....	Hind, Rolph & Co.	Freight	6,034	10¼	418.0 x 56.0 x 32.0	2,400	.....
La Brae	Union Oil Co. of California	Oil Carrier..	7,445	....	453	2,600	.....

Inland River Ship Yards

Dubuque Boat & Boiler Works, Dubuque, Ia.

———	Missouri Sand Co.	Barge	400	....	100	.....	.....

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Table II.
Merchant Tonnage Building Jan. 1, 1916
Atlantic Coast Ship Yards

Baltimore Dry Docks & Shipbuilding Co., Baltimore.

Name.	Owner.	Type.	Gross tonnage,	Speed, knots.	Length, Breadth and Depth, feet.	I. H. P.	Probable date of Launching.
Not named	Transatlantic Motor Ship Co.	Oil Carrier..	3,500	11½	306.0 x 47.0 x 28.0	.....	Apr. 1, '16
Not named	Transatlantic Motor Ship Co.	Oil Carrier..	3,500	11½	306.0 x 47.0 x 28.0	.....	Apr. 1, '16
Not named	Transatlantic Motor Ship Co.	Oil Carrier..	3,500	11½	306.0 x 47.0 x 28.0	.....	Oct. 1, '16
Not named	Transatlantic Motor Ship Co.	Oil Carrier..	3,500	11½	306.0 x 47.0 x 28.0	.....	Oct. 1, '16

Bath Iron Works, Bath, Me.

Not named	Cox & Stevens	Yacht	418	....	225	7,500	.....

Chester Shipbuilding Co., Chester, Pa.

Not named	Foreign owners	Oil Carrier..	5,000	....	.....	.....	June, 1916
Not named	Foreign owners	Oil Carrier..	5,000	....	.....	.....	Aug., 1916
Not named	————	Freight	4,000	11	.....	.....	Nov., 1916

G. G. Deering Co., Bath, Me.

Not named	G. G. Deering Co.	Schooner ...	1,900	....	250	.....	.....

Ellicott Machine Corporation, Baltimore.

Not named	Pennsylvania Railroad Co.	——	250	11	.....	.....	Jan. 25, '16
Not named	Pennsylvania Railroad Co.	——	250	11	.....	.....	Feb. 25, '16
Not named	Pennsylvania Railroad Co.	——	250	11	.....	.....	Mar. 25, '16

Fore River Shipbuilding Corporation, Quincy, Mass.

Cubadist	Cuba Distilling Co.	Molasses ...	5,600	10½	406.0 x 54.5 x 32.5	.....	.....
Sucrosa	Cuba Distilling Co.	Molasses ...	5,600	10½	406.0 x 54.5 x 32.5	.....	.....
Mielero	Cuba Distilling Co.	Molasses ...	5,600	10½	406.0 x 54.5 x 32.5	.....	.....
Edwin Luckenbach	E. F. Luckenbach	Freight	8,100	12	456.4 x 57.0 x 41.6	.....	.....
Julia Luckenbach..	E. F. Luckenbach	Freight	8,100	12	456.4 x 57.0 x 41.6	.....	.....
Not named	E. F. Luckenbach	Freight	8,100	....	459.0 x 55.9 x 40.7	.....	.....
Not named	E. F. Luckenbach	Freight	8,100	....	459.0 x 55.9 x 40.7	.....	.....
Not named	Texas Steamship Co.	Oil Carrier..	6,500	11	431.9 x 56.0 x 32.8	.....	.....
Not named	Texas Steamship Co.	Oil Carrier..	6,500	11	431.9 x 56.0 x 32.8	.....	.....

Harlan & Hollingsworth Corporation, Wilmington, Del.

Pearl Shell	Shell Co. of California	Oil Carrier..	5,605	11	427.0 x 53.4 x 31.0	2,700	Mar. 1, '16
Not named	Petroleum Transport Co.	Oil Carrier..	5,347	11	404.0 x 51.0 x 24.3	2,800	Feb. 15, '16
Benj. Brewster....	Standard Oil Co.	Oil Carrier..	5,605	10½	427.0 x 53.4 x 31.0	2,550	June 1, '16
W. H. Tilford....	Standard Oil Co.	Oil Carrier..	5,605	10½	427.0 x 53.4 x 31.0	2,550	Sep. 15, '16
Not named	Standard Oil Co.	Oil Carrier..	8,490	10½	480.0 x 60.0 x 36.3	3,000	Dec. 1, '16
Not named	Standard Oil Co.	Oil Carrier..	5,605	10½	427.0 x 53.4 x 31.0	2,550	Jan. 15, '17
Not named	Wilmington Steamboat Co.	River	750	15	203.0 x 40.0 x 11.1	1,200	Feb. 1, '16
Not named	Balti. & Carolina Steamship Co.	Freight	2,010	10	255.0 x 39.0 x 28.0	800	June 1, '16
Not named	Vacuum Oil Co.	Frt. & Oil..	2,750	10	308.0 x 44.0 x 26.9	1,500	Dec. 15, '16
Not named	Vacuum Oil Co.	Oil Carrier..	5,605	11	427.0 x 53.4 x 31.0	2,700	May 1, '17
Not named	Ocean Steamship Co. of Savannah	Frt. & Pass.	4,500	12½	435.0 x 53.0 x 35.0	3,500	Sep. 1, '17

Kelley-Spear Co., Bath, Me.

Not named	New England Steamship Co.	Lighter	450	....	90	.....	.....
Not named	New England Steamship Co.	Lighter	450	....	90	.....	.....
Not named	New England Steamship Co.	Lighter	450	....	90	.....	.....
Not named	New England Steamship Co.	Lighter	450	....	90	.....	.....
Not named	————	Barge	1,584	....	255	.....	.....

Maryland Steel Co., Sparrows Point, Md.

Artisan	American-Hawaiian Steamship Co.	Freight	5,800	....	404.8	2,500	.....
Arborean	American-Hawaiian Steamship Co.	Freight	5,800	....	404.8	2,500	.....
Margaret	A. H. Bull & Co.	Freight	3,628	....	338	1,500	.....
Munsomo	Munson Steamship Line.	Freight	3,628	....	338	2,300	.....
Munplace	Munson Steamship Line.	Freight	3,628	....	338	2,300	.....
Not named	Munson Steamship Line.	Freight	4,000	10	346.5	2,300	Aug. 15, '16
Not named	Bull-Insular Steamship Co.	Freight	3,800	12	338	2,500	July 1, '16
Not named	Bull-Insular Steamship Co.	Freight	3,800	12	338	2,500	Sep. 1, '16
Not named	Standard Oil Co.	Oil Carrier..	10,000	10½	516.6	3,000	Nov. 1, '16
Not named	Standard Oil Co.	Oil Carrier..	10,000	10½	516.6	3,000	Jan. 1, '17

Newport News Shipbuilding & Dry Dock Co., Newport News, Va.

Charles Pratt.....	Standard Oil Co.	Oil Carrier..	10,900	10½	.....	3,000	Nov. 15, '16
H. H. Rogers.....	Standard Oil Co.	Oil Carrier..	10,900	10½	.....	3,000	Dec. 15, '16
Antwerpen	Standard Oil Co.	Oil Carrier..	8,374	....	.....	2,800	.....
Not named	Standard Oil Co.	Oil Carrier..	10,900	10½	.....	3,000	Aug., 1917
Not named	Standard Oil Co.	Oil Carrier..	10,900	10½	.....	3,000	.....
Not named	Standard Oil Co.	Oil Carrier..	10,900	10½	.....	3,000	.....
E. F. Luckenbach.	Edgar F. Luckenbach	Freight	8,000	....	.....	3,600	.....
Not named	Mallory Steamship Co.	Frt. & Pass.	6,000	....	.....	4,000	.....
Munalbro	Munson Steamship Line.	Freight	4,600	10½	.....	1,700	Feb., 1917
Not named	Munson Steamship Line.	Freight	4,600	10½	.....	2,200	.....
Not named	Crowell & Thurlow Steamship Co.	Freight	5,900	10	.....	2,200	Sep. 15, '16
Not named	Crowell & Thurlow Steamship Co.	Freight	5,900	10	.....	2,200	Dec. 1, '16
Not named	Southern Pacific Co.	Oil Carrier..	5,125	11	.....	2,300	May, 1917
Not named	Southern Pacific Co.	Freight	4,500	11	.....	2,200	May, 1917
Not named	Southern Pacific Co.	Freight	4,500	11	.....	2,200	June, 1917
Not named	Atlantic Refining Co.	Oil Carrier..	8,400	10½	.....	3,000	July, 1917

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Table II.

(Continued)

Merchant Tonnage Building Jan. 1, 1916

Atlantic Coast Ship Yards

(Continued)

New York Shipbuilding Co., Camden, N. J.

Name.	Owner.	Type.	Gross tonnage.	Speed, knots.	Length, Breadth and Depth, feet.	I. H. P.	Probable date of launching.
Bylayl	Pocahontas Navigation Co.	Collier	3,289	10½	333.1 x 49.3 x 27.5	1,800	
Not named	Pocahontas Navigation Co.	Collier	3,289	10½	333.1 x 49.3 x 27.5	1,800	
Not named	Standard Oil Co.	Oil Carrier..	10,250	....	485.3 x 62.5 x 39.5	3,200	
Not named	Standard Oil Co.	Oil Carrier..	10,250	....	485.3 x 62.5 x 39.5	3,200	
Not named	Standard Oil Co.	Oil Carrier..	10,250	....	485.3 x 62.5 x 39.5	3,200	
Not named	Standard Oil Co.	Oil Carrier..	10,250	....	485.3 x 62.5 x 39.5	3,200	
Not named	Petroleum Transport Co.	Oil Carrier..	10,250	....	485.3 x 62.5 x 39.5	3,200	
Not named	Gulf Refining Co.	Oil Carrier..	10,250	....	485.3 x 62.5 x 39.5	3,200	
Not named	Gulf Refining Co.	Oil Carrier..	5,188	....	406.5 x 51.0 x 30.2	2,650	
Bristol	Coastwise Transportation Co.	Collier	4,015	....	377.0 x 49.0 x 30.0	1,920	
Not named	Coastwise Transportation Co.	Collier	5,266	10½	395.1 x 55.0 x 34.4	2,500	
Not named	Darrow-Mann Co.	Collier	8,500	10½	453.9 x 63.5 x 37.3	3,200	
Not named	Darrow-Mann Co.	Collier	5,266	10½	395.1 x 55.0 x 34.4	2,500	
Not named	Darrow-Mann Co.	Collier	5,266	10½	395.1 x 55.0 x 34.4	2,500	
Not named	New York Central R. R.	Carfloat	750	....	260.0 x 38.0 x 10.0	.....	
Not named	New York Central R. R.	Carfloat	750	....	260.0 x 38.0 x 10.0	.....	
Not named	New York Central R. R.	Carfloat	750	....	260.0 x 38.0 x 10.0	.....	
Not named	New York Central R. R.	Carfloat	750	....	260.0 x 38.0 x 10.0	.....	
Not named	New York Central R. R.	Carfloat	765	....	265.0 x 38.0 x 10.0	.....	
Not named	New York Central R. R.	Carfloat	765	....	265.0 x 38.0 x 10.0	.....	
Not named	New York Central R. R.	Carfloat	765	....	265.0 x 38.0 x 10.0	.....	
Not named	New York Central R. R.	Carfloat	765	....	265.0 x 38.0 x 10.0	.....	

Pusey & Jones Co., Wilmington, Del.

Not named	Pennsylvania Railroad Co.	Freight	328	....	.....	.....	Jan. 10, '16
Not named	Pennsylvania Railroad Co.	Freight	328	....	.....	.....	Jan. 29, '16
Not named	Pennsylvania Railroad Co.	Freight	328	....	.....	.....	Feb. 29, '16
Not named	W. & A. Fletcher Co.	Towing	300	....	.....	.....	Apr. 6, '16
Not named	Philadelphia & Reading Railroad Co.	Towing	100	....	.....	.....	Mar. 1, '16

Charles L. Rohde & Sons Co., Baltimore.

Not named	Maryland Elevator Co.	Lighter	400	....	85.0 x 32.0 x 8.5	.....	.....
Not named	H. S. Kerbaugh	Lighter	125	....	72.0 x 22.0 x 6.5	.....	.....
Not named	Charles L. Rohde & Sons Co.	Float D. D.	1,500	....	185.0 x 62.0 x 7.5	.....	.....
Not named	John Jones	Lighter	250	....	80.0 x 24.0 x 7.5	.....	.....

Spedden Shipbuilding Co., Baltimore.

Not named	John T. Donohue	Tug	...	....	125	.....	June 1, '16

Staten Island Shipbuilding Co., Port Richmond, N. Y.

Not named	International Elevating Co.	Elevator	500	....	125	.....	.....
Not named	Pennsylvania Railroad Co.	Tug	300	....	110	350	.....
Not named	New York Central R. R.	Lighter	300	....	114	300	.....
Not named	Lehigh Valley Railroad Co.	Tug	241	....	108	950	.....

Arthur D. Story, Essex, Mass.

Pollyanna	Gorton Pen Co.	Schooner	120	....	117	.....	.....
Finback	C. H. W. Foster	Yawl	160	....	136	100	.....
Not named	West Indies Dyewood Co.	Aux. Sch.	100	....	115	50	.....

William Cramp & Sons Ship & Engine Building Co., Philadelphia.

Santa Rosa	W. R. Grace & Co.	Frt. & Pass.	6,300	12	400	.....	Oct. 2, '16
Santa Paula	W. R. Grace & Co.	Frt. & Pass.	6,300	12	400	.....	Nov. 1, '16
Not named	Petroleum Transport Co.	Oil Carrier..	7,100	11	.....	.....	Oct. 1, '16
Not named	Petroleum Transport Co.	Oil Carrier..	7,100	11	.....	.....	Nov. 2, '16
Not named	Petroleum Transport Co.	Oil Carrier..	7,100	11	.....	.....	.....
Not named	Sun Co.	Oil Carrier..	7,100	11	.....	.....	May 15, '16
Not named	Sun Co.	Oil Carrier..	7,100	11	.....	.....	June 15, '16
Not named	Florida East Coast Railway Co.	Carferry	2,700	12	360.0 x 57.0 x 22.0	3,000	Apr. 20, '16
Not named	Atlantic, Gulf & West Indies Co.	Frt. & Pass.	8,000	17	425	.....	Dec. 1, '16
Not named	Atlantic, Gulf & West Indies Co.	Frt. & Pass.	8,000	17	425	.....	Jan. 2, '17
Jalisco	Mexican Navigation Co.	Frt. & Pass.	4,000	....	.....	.....	.....
Coahuila	Mexican Navigation Co.	Frt. & Pass.	4,000	....	.....	.....	.....

William E. Woodall & Co., Baltimore.

Not named	P. Dougherty Co.	Sch.	1,250	....	225	.....	.....

Great Lakes Ship Yards

American Shipbuilding Co., Cleveland.

Not named	Pittsburgh Steamship Co.	Bulk Frtr...	7,700	10	600.0 x 60.0 x 32.0	2,300	April, 1916
Not named	Pittsburgh Steamship Co.	Bulk Frtr...	7,700	10	600.0 x 60.0 x 32.0	2,300	July, 1916
Not named	Interlake Steamship Co.	Bulk Frtr...	7,700	10	600.0 x 60.0 x 32.0	2,300	Mar., 1916
Not named	Herbert K. Oakes	Bulk Frtr...	7,700	10	600.0 x 60.0 x 32.0	2,300	July, 1916
Not named	M. A. Hanna & Co. (Trustees)	Bulk Frtr...	6,000	10	524.0 x 54.0 x 30.0	1,900	Aug., 1916
Not named	Limestone Transportation Co.	Bulk Frtr...	6,500	13	550.0 x 60.0 x 31.0	2,500	.....
Not named	A. H. Skaugaards	Freight	2,100	9½	260.0 x 43.5 x 20.0	1,600	April, 1916
Not named	Arthur Mathiesen	Freight	2,100	9½	260.0 x 43.5 x 20.0	1,600	April, 1916
Not named	A. O. Lindvig	Freight	2,100	9½	260.0 x 43.5 x 20.0	1,600	April, 1916
Not named	A. O. Lindvig	Freight	2,100	9½	260.0 x 43.5 x 20.0	1,600	April, 1916
Not named	Erling Lund	Freight	2,100	9½	260.0 x 43.5 x 20.0	1,600	April, 1916
Not named	Erling Lund	Freight	2,100	9½	260.0 x 43.5 x 20.0	1,600	April, 1916
Not named	G. B. Hall Coal Co.	Freight	2,100	10	257.0 x 43.0 x 23.0	1,600	April, 1916

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Table II.

(Continued)

Merchant Tonnage Building Jan. 1, 1916

Great Lakes Ship Yards

(Continued)

Great Lakes Engineering Works, Detroit.

Name.	Owner.	Type.	Gross tonnage,	Speed, knots.	Length, Breadth and Depth, feet.	I. H. P.	Probable date of launching.
Not named	Merritt & Chapman	Wrecking ..	500	10	142.0 x 30.0 x 16.0	750	.....
Not named	Pittsburgh Steamship Co.	Bulk Frtr...	7,700	10	600.0 x 60.0 x 32.0	2,300	.....
Not named	Wyandotte Transportation Co.	Bulk Frtr...	4,810	10	439.3 x 56.0 x 30.0	1,775	.....
Not named	Morris Adler, Inc.	Collier	2,482	10	262.0 x 43.5 x 27.5	1,350	.....
Not named	Morris Adler, Inc.	Collier	2,482	10	262.0 x 43.5 x 27.5	1,350	.....
Not named	Clyde Steamship Co.	Freight	2,500	10	261.0 x 43.0 x 29.8	1,100	.....
Not named	Clyde Steamship Co.	Freight	2,500	10	261.0 x 43.0 x 29.8	1,100	.....
Not named	J. L. Crosthwaite	Freight	1,709	10	256.3 x 43.0 x 19.2	700	.....
Not named	Argentina government	Oil Carrier..	2,200	10	262.0 x 43.5 x 25.5	1,150	.....
Not named	————	Collier	2,550	10	261.0 x 43.5 x 27.5	1,350	.....
Not named	————	Collier	2,550	10	261.0 x 43.5 x 27.5	1,350	.....
Not named	————	Bulk Frtr...	7,700	10	600.0 x 60.0 x 32.0	2,300	Spring, '17
Not named	————	Collier	2,550	10	261.0 x 43.5 x 27.5	1,350	Spring, '17

Manitowoc Shipbuilding & Dry Dock Co., Manitowoc, Wis.

Not named	Bay State Fishing Co.	Trawler	300	10	144.0 x 22.5 x 14.3	.....	May 15, '16
Not named	Bay State Fishing Co.	Trawler	300	10	144.0 x 22.5 x 14.3	.....	June 15, '16
Not named	Bay State Fishing Co.	Trawler	300	10	144.0 x 22.5 x 14.3	.....	July 15, '16
Not named	City of Cleveland	Fireboat ...	100	9	83.5 x 20.5 x 11.5	.....	May 15, '16

Toledo Shipbuilding Co., Toledo, O.

Not named	Smith Shipping Co.	Aux. Sch...	1,700	7	261.0 x 43.5 x 23.5	450	April, 1916
Not named	Smith Shipping Co.	Aux. Sch...	1,700	7	261.0 x 43.5 x 23.5	450	April, 1916
Not named	Smith Shipping Co.	Aux. Sch...	1,700	7	261.0 x 43.5 x 23.5	450	May, 1916
Not named	Smith Shipping Co.	Aux. Sch...	1,700	7	261.0 x 43.5 x 23.5	450	June, 1916
Not named	Smith Shipping Co.	Aux. Sch...	1,700	7	261.0 x 43.5 x 23.5	450	July, 1916
Not named	Smith Shipping Co.	Aux. Sch...	1,700	7	261.0 x 43.5 x 23.5	450	Aug., 1916
Not named	Great Lakes Steamship Co.	Bulk Frtr...	7,700	10	600.0 x 60.0 x 32.0	2,300	Aug., 1916

Pacific Coast Ship Yards

Seattle Construction & Dry Dock Co., Seattle.

Not named	New York & Cuba Mail Steamship Co..	Freight	3,900	12	368.0 x 47.8 x 27.3	2,500	May 1, '16
Not named	New York & Cuba Mail Steamship Co..	Freight	3,900	12	368.0 x 47.8 x 27.3	2,500	June 1, '16

Union Iron Works Co., San Francisco.

Not named	Hind, Rolph & Co.	Freight	6,034	10½	418.0 x 56.0 x 32.0	2,400	.....
Los Angeles	Union Oil Co. of California	Oil Carrier..	7,445	....	453	2,600	.....
Not named	Union Oil Co. of California	Oil Carrier..	7,445	....	453	2,600	.....
Not named	Standard Oil Co.	Oil Carrier..	8,000	11	457	3,300	.....
Not named	Standard Oil Co.	Oil Carrier..	7,445	11	453	2,600	.....
Not named	Standard Transportation Co.	Oil Carrier..	8,000	11	457	3,300	.....
Not named	Matson Navigation Co.	Frt. & Pass.	9,728	16	501.1	8,500	.....
Not named	Atlantic Gulf & Refining Co.	Oil Carrier..	7,445	11	453	2,600	.....
Not named	Atlantic Gulf & Refining Co.	Oil Carrier..	7,445	11	453	2,600	.....
Eurana	————	Freight	5,900	....	418	2,400	.....
Not named	Walker Armstrong Co.	Freight	6,700	....	.....	2,400	.....
Not named	Vacuum Oil Co.	Oil Carrier..	8,000	11	457	3,300	.....

United Engineering Works, San Francisco.

Not named	Foreign owners	Freight	3,500	9	340	1,500	Sept. 1, '16

Inland River Ship Yards

American Bridge Co., New York.

Not named	Aluminum Ore Co.	————	500	....	.....	.....	Jan. 1, '16
Not named	Aluminum Ore Co.	————	500	....	.....	.....	Jan. 1, '16
Not named	Aluminum Ore Co.	————	500	....	.....	.....	Jan. 1, '16
Not named	Aluminum Ore Co.	————	500	....	.....	.....	Jan. 1, '16
Not named	Crucible Fuel Co.	————	590	....	.....	.....	Feb., 1916
Not named	Crucible Fuel Co.	————	590	....	.....	.....	Feb., 1916
Not named	Crucible Fuel Co.	————	590	....	.....	.....	Mar., 1916
Not named	Crucible Fuel Co.	————	590	....	.....	.....	Mar., 1916
Not named	Crucible Fuel Co.	————	590	....	.....	.....	Mar., 1916
Not named	Lehigh Valley Railroad Co.	————	960	....	.....	.....	May, 1916
Not named	Lehigh Valley Railroad Co.	————	960	....	.....	.....	June, 1916
Not named	Lehigh Valley Railroad Co.	————	960	....	.....	.....	June, 1916
Not named	Lehigh Valley Railroad Co.	————	960	....	.....	.....	July, 1916
Not named	Lehigh Valley Railroad Co.	————	580	....	.....	.....	July, 1916
Not named	Lehigh Valley Railroad Co.	————	580	....	.....	.....	Aug., 1916
Not named	Lehigh Valley Railroad Co.	————	580	....	.....	.....	Aug., 1916

Howard Ship Yards Co., Jeffersonville, Ind.

Not named	Baton Rouge Ferry Co.	Ferry	500	..	.....	.....	.....
Not named	Baton Rouge Ferry Co.	Ferry	500	..	.....	.....	.....
Not named	Baton Rouge Ferry Co.	Ferry	500	..	.....	.....	.....
Not named	Inland Navigation Co.	Freight	450	..	.....	.....	.....
Not named	Inland Navigation Co.	Barge	1,200	..	.....	.....	.....
Not named	Inland Navigation Co.	Barge	1,400	..	.....	.....	.....
Not named	Inland Navigation Co.	Barge	3,000	..	.....	.....	.....

Gulf Ship Yards

Clooney Construction & Towing Co., Westlake La.

Magnolene	Magnolia Petroleum Co.	Barge	840	....	201	.....	.....
Powell	Oil Fields of Mexico Co.	Aux. Sch...	250	....	108	.....	.....

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Future Bright for American Marine

Shipping Industry Takes New Encouragement from Large Merchant Tonnage Under Construction—Great Increase in Vessels in Foreign Trade

By R. V. Sawhill

THE advocates of an American merchant marine, after years of discouragement, are facing 1916 with a more solidly grounded optimism than any previous year in the last half century. The reasons for this changed sentiment are clearly defined. American ship yards now have under order the largest tonnage in their history; the documented tonnage of the United States merchant marine is the largest ever recorded and the tonnage of American vessels registered in the foreign trade is the greatest since 1863.

According to information furnished *The Marine Review* by practically all of the ship yards of the country, the present merchant tonnage under construction is 751,266 tons. These returns, which take into consideration only vessels of 100 tons capacity or greater, are presented in the tables on pages 44-46. Statistics, also gathered by *The Marine Review,* show the tonnage of merchant vessels launched during 1915 to be 122,568 tons. While some of these vessels are destined ultimately for foreign owners, by far the greater number will sail under the American flag.

What is the real meaning of this unparalleled expansion? The documented tonnage of American ships on Dec. 1, 1915, was 8,443,258 tons. On this basis, the ships now being built represent 9 per cent of the present merchant marine of this country. The recent report of the commissioner of navigation pointed out that the actual increase in the fiscal year ending June 30, 1915, was 460,741 tons, or 5.81 per cent, the largest gain in the history of the country. To find earlier increases comparable with the 1915 gain, we must go back, with one exception, to the period preceding the civil war. The increase in 1908 was 426,651 tons, but no other increase of like importance is found until 1855, when an increase of 409,099 tons was recorded.

The real significance of these figures is to put into comparative terms the extent of the first genuine revival experienced by the American merchant marine in the past half century. They register with remarkable clarity the extent to which this country has been aroused to the need of adequate shipping facilities. The lethargy that years of patient reasoning failed to shake, has given way to a country-wide conviction that ships are imperatively needed—and they are being provided. The months following the signing of peace may disturb the entire commercial fabric of all maritime nations, but even if the worst of the fears sometimes expressed are realized, they can offset to only a slight degree the value to this country of its overnight conversion to a policy of merchant marine expansion.

The Record of 127 Years

Year.	Vessel, number.	Documented tonnage.	Increase or Decrease (—) from preceding year, per cent.	Registered in foreign trade, tons.
1915*	26,888	8,443,258	.64	
1915†	26,701	8,389,429	5.81	1,862,714
1914	26,943	7,928,688	.53	1,066,288
1913	27,070	7,886,518	2.23	1,019,165
1912	26,528	7,714,183	.99	923,225
1911	25,991	7,638,790	1.74	963,495
1910	25,740	7,508,082	1.61	782,517
1909	25,688	7,388,755	.32	878,523
1908	25,425	7,365,455	6.15	930,413
1907	24,911	6,938,794	3.95	861,466
1906	25,006	6,674,969	3.38	928,466
1905	24,681	6,456,543	2.62	943,750
1904	24,558	6,291,535	3.35	888,628
1903	24,425	6,087,345	4.99	879,264
1902	24,273	5,797,902	4.95	873,235
1901	24,057	5,524,218	6.96	879,595
1900	23,333	5,164,839	6.18	816,795
1899	22,728	4,864,238	2.41	837,229
1898	22,705	4,749,738	—.40	726,213
1897	22,633	4,769,020	1.38	792,870
1896	22,908	4,703,880	1.47	829,833
1895	23,240	4,635,960	—1.03	822,347
1885	23,963	4,265,934	—.12	1,262,814
1875	32,285	4,853,732	1.10	1,515,598
1865	.....	5,096,782	2.21	1,518,350
1855	.....	5,212,001	8.52	2,348,358
1845	.....	2,417,002	6.00	904,476
1835	.....	1,824,941	3.75	788,173
1825	.....	1,423,111	2.44	665,409
1815	.....	1,368,128	18.02	824,295
1805	.....	1,140,367	9.40	744,224
1795	.....	747,965	19.00	529,471
1789	.....	201,562	.....	123,893

*Dec. 1; †1845-1915, fiscal years end June 30; 1835, Sept. 30; earlier years, Dec. 31.

A short summary of American merchant marine history will show the belated attention given by this country to its all important shipping industry. In 1851, the tonnage of merchant shipping owned in the United States was 3,718,640 tons, while that of the entire British Empire was only 4,332,085 tons. At this time, the famous American clipper ships were carrying not only the bulk of our foreign trade but were found on all the waters of the globe. The financial depression of 1857-59 proved serious not only in its immediate consequences but in its relation to the future of the American marine. When business conditions had improved, the Americans found that iron had superseded wood in British ship yards and the advantages of the great American forests were nullified. The British shipowners who had been accustomed to charter American tonnage, no longer required the American built sailing vessel. The early approach of the civil war with the havoc created among American ships by hostile raiders, the wholesale transfer of American ships to foreign registry to escape capture and destruction, and the failure to modernize our navigation laws to confront the changed conditions brought about by the introduction of steam, were the principal contributing factors in bringing about the decline in the importance of this country in world shipping. Congress passed a law refusing American registry to those vessels transferred to foreign flags under the stress of war times. The development of the country's natural resources, the expansion of railroads and the settling of the west, so fully engaged the country's attention in the years following, that the influence of the American ship in world trade, steadily waned. The country's marvellous growth obscured the importance of this condition, and dulled the keen interest which every citizen of the country in the first 60 years of its existence, had taken in fostering the growth of an American marine. Proponents of the American shipping industry met little encouragement in their efforts to properly adjust the inequitable burdens under which the remnant of our fleet struggled.

The first attempt toward adopting a liberal policy in regard to the American merchant marine, was made in certain sections of the Panama Canal act of 1912, which admitted certain classes of foreign built ships to American registry. Following this, came the act of Aug. 18, 1914, under which 171 foreign built vessels of 583,733 gross tons were admitted to American registry up to Dec. 18. Many of these ships had been owned by American capital which was forced by hostile or antiquated laws to keep these vessels under a foreign flag.

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Vessels Building for U. S. Navy

No.	Name of vessel.		Percentage of completion. Dec. 1, 1915. Total.	On ship.
		Battleships.		
36	Nevada	Fore River S. B. Co.	98.0	97.9
37	Oklahoma	New York S. B. Co.	98.5	98.5
38	Pennsylvania	Newport News S. B. Co.	92.5	90.7
39	Arizona	New York Navy Yard	76.0	74.1
40	California	New York Navy Yard	11.2	6.5
41	Mississippi	Newport News S. B. Co.	35.3	20.2
42	Idaho	New York S. B. Co.	48.3	40.5
		Destroyers.		
57	Tucker	Fore River S. B. Corpn.	87.1	86.6
58	Conyngham	Wm. Cramp & Sons.	90.8	90.7
59	Porter	Wm. Cramp & Sons.	87.2	86.6
61	Jacob Jones	New York S. B. Co.	95.9	95.9
62	Wainwright	New York S. B. Co.	93.5	93.5
63	Sampson	Fore River S. B. Corpn.	70.0	66.5
64	Rowan	Fore River S. B. Corpn.	62.5	56.7
65	Davis	Bath Iron Works.	62.3	59.9
66	Allen	Bath Iron Works.	58.3	55.4
67	Wilkes	Wm. Cramp & Sons.	41.3	36.9
68	Shaw	Mare Island Navy Yard.	14.8	9.6
69		Mare Island Navy Yard.	....	....
70		Norfolk Navy Yard.	....	....
71		Seattle Const. & D. D. Co.	....	....
72		Wm. Cramp & Sons.	....	....
73		Wm. Cramp & Sons.	....	....
74		Bath Iron Works.	....	....
		Fuel Ships.		
14	Maumee	Mare Island Navy Yard.	97.5	97.4
15	Cuyama	Mare Island Navy Yard.	12.1	2.4
		Miscellaneous.		
	Supply Ship No. 1	Boston Navy Yard.	35.3	32.7
	Transport No. 1.	Philadelphia Navy Yard.	40.9	38.3

No.	Name of vessel.		Percentage of completion, Dec. 1, 1915. Total.	On ship.
		Submarines.		
27*	G-2	Lake T. B. Co., Bridgeport.	89.7	89.7
31*	G-3	Lake T. B. Co., Bridgeport.	88.6	88.4
40	L-1	Electric Boat Co., Quincy.	98.9	98.9
41	L-2	Electric Boat Co., Quincy.	98.5	98.5
42	L-3	Electric Boat Co., Quincy.	98.1	98.1
43	L-4	Electric Boat Co., Quincy.	98.1	98.1
44	L-5	Lake T. B. Co., Bridgeport.	83.1	77.1
45	L-6	Lake T. B. Co., Lg. Beach, Cal.	74.1	71.4
46	L-7	Lake T. B. Co., Lg. Beach, Cal.	76.1	67.4
47	M-1	Electric Boat Co., Quincy.	89.9	89.6
48	L-8	Portsmouth, N. H., Navy Yard	62.3	61.0
49	L-9	Electric Boat Co., Quincy.	88.9	87.9
50	L-10	Electric Boat Co., Quincy.	87.6	86.2
51	L-11	Electric Boat Co., Quincy.	81.3	77.4
52	Schley	Electric Boat Co., Quincy.	....	....
53	N-1	Electric Boat Co., Seattle.	39.1	33.1
54	N-2	Electric Boat Co., Seattle.	39.1	33.1
55	N-3	Electric Boat Co., Seattle.	39.1	33.1
56	N-4	Lake T. B. Co., Bridgeport.	49.0	39.1
57	N-5	Lake T. B. Co., Bridgeport.	46.4	37.7
58	N-6	Lake T. B. Co., Bridgeport.	44.6	35.7
59	N-7	Lake T. B. Co., Bridgeport.	45.4	36.5
62	O-1	Portsmouth, N. H., Navy Yard	....	....
63	O-2	Puget Sound Navy Yard.	....	....
64	O-3	Electric Boat Co., Quincy.	....	....
65	O-4	Electric Boat Co., Quincy.	....	....
66	O-5	Electric Boat Co., Quincy.	....	....
67	O-6	Electric Boat Co., Quincy.	....	....
68	O-7	Electric Boat Co., Quincy.	....	....
69	O-8	Electric Boat Co., Quincy.	....	....
70	O-9	Electric Boat Co., Quincy.	....	....
71	O-10	Electric Boat Co., Quincy.	....	....
72	O-11	Lake T. B. Co., Bridgeport.	....	....
73	O-12	Lake T. B. Co., Bridgeport.	....	....
74	O-13	Lake T. B. Co., Bridgeport.	....	....
75	O-14	Cal. SB. Co., Long Beach, Cal.	....	....
76	O-15	Cal. SB. Co., Long Beach, Cal.	....	....
77	O-16	Cal. SB. Co., Long Beach, Cal.	....	....

*Contracts forfeited, vessels being completed in New York Yard.

Viewed from a legislative standpoint, conditions in the American shipping industry, are still far from satisfactory. The most encouraging feature, however, is found in the fact that the country as a whole realizes more forcibly than at any other time in years, the need for American ships. In this fact lies the hope for constructive legislation. In tonnage, the United States now ranks second among the nations of the world. Included in this figure are boats for coastwise, lake and river service. In the foreign trade, however, only 8⅔ per cent of our exports and imports were carried under the American flag in the fiscal year immediately preceding the war. It is in this field that the American shipping industry must look for expansion and with more than 90 per cent of our trade borne under foreign flags the opportunities for a healthy growth are unlimited.

American capital and American ship builders have proved in the past few months that they can supply the ships. Given the encouragement that has been denied them for years, the great changes effected in 1915 can be rendered permanent and the American merchant marine become a powerful factor in world commerce.

Foreign Vessels Admitted to American Registry

BETWEEN MAY 30, 1915, AND DEC. 18, 1915.

Rig.	Name of vessel.	Type.	Gross tons.	When built.	Home port.	Owner.	Former name.	Former Nationality.
St. s.	Siberia	Freight	3,535	1894	New York.	Siberia S. S. Corp'n.	———	.....
Bkn.	Alta	Freight	1,381	1900	San Francisco.	Barkentine Alta Co.	Alta	.....
Ga. s.	Glenpool	Tanker	5,459	1913	New York.	Standard Oil Co.	Hagen	German
St. s.	Communipaw	Tanker	3,710	1913	New York.	Standard Oil Co.	Deutschland	German
Bark	Paolina	Freight	1,337	1900	Mobile	Edward L. Whitney.	Paolina	.....
St. s.	Winnebago	Freight	4,362	1900	New York.	American Transatlantic Co.	———	Danish
St. s.	Solveig	Freight	4,409	1901	New York.	American Transatlantic Co.	Nyland	Danish
St. s	Kankakee	Freight	3,718	1899	New York.	American Transatlantic Co.	Lapland	Norwegian
St. s.	Allaguash	Freight	3,826	1905	New York.	American Transatlantic Co.	Rygja	Danish
St. s.	Manitowoc	Freight	4,471	1902	New York.	Manitowoc S. S. Corp'n.	Spyros Vallianos.	Danish
St. s.	San Mateo	Freight	3,300	1915	New York.	San Mateo S. S. Corp'n.	———	.....
St. s.	Genesee	Freight	2,892	1900	New York.	American Transatlantic Co.	———	.....
St. s.	Maumee	Freight	2,556	1897	New York.	Maumee S. S. Corp'n.	Djursland	Danish
St. s.	Winneconne	Freight	1,869	1907	New York.	Winneconne S. S. Corp'n.	Hoagland	Danish
St. s.	Ausable	Freight	3,153	1901	New York.	American Transatlantic Co.	Laura	Dutch
Sch.b.	Prins Valdemar.	Freight	1,361	1892	San Francisco.	G. W. McNear, Inc.	Prins Valdemar.	Mexican
St. y.	Casiana	Pleasure	1,227	1908	Los Angeles.	Edward L. Doheny.	Cassandra	*
St. s.	Muskegon	Freight	3,323	1897	New York.	American Transatlantic Co.	Gotland	Danish
Sch.	Albania	Freight	257	1905	New York.	Wm. Willard Howard.	G. M. Cochrane.	British
St. s.	Yucatan	Freight	751	1896	Philadelphia	J. W. Jolly.	Yucatan	Mexican
St. s.	Hocking	Freight	2,553	1895	New York.	American Transatlantic Co.	Gronland	Danish
St. s.	Edna	Freight	1,783	1903	San Francisco.	Sudden & Christenson.	Mazatlan	Mexican
St. s.	Amazonia	Freight	2,199	1891	New York.	Lawrence Smith, Inc.	Amazonia	Brazilian
St. s.	Republic	Freight	3,932	1907	San Francisco.	John A. Hooper.	Walkure	German
St. s.	Constitution	———	3,358	1899		Carribbean & S'th'n S. S. Co.	Hatasu	Ecuadorean

*Not documented.

Grand total, Aug. 18, 1914 to Dec. 18, 1915, 171 vessels, 583,733 gross tons.

(For vessels registered previous to May 30, 1915, see *The Marine Review*, July, 1915, page 248 and December, 1914, page 466.)

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Lake Ship Yards Take Many Orders

Building Berths Are Well Filled—Bulk Freighters Again in Demand—Large Number of Salt Water Boats Under Construction

CONDITIONS confronting lake ship yards at the opening of 1916, closely parallel those found on the eastern and western seaboards. Building berths are filled for months ahead, prospective ship owners are forced to be content with 1917 delivery, and yards that have not been utilized for several years are being pressed into service to meet the insistent demand for tonnage.

The lake ship building industry promises to recuperate in 1916 some of the losses incurred during the past several years, through the dearth of new tonnage ordered. The backbone of lake ship building, the bulk freighter, is again in demand after a year of unprecedentedly light orders. The latest order placed for this distinctive type of lake vessel, calls for 1917 delivery. This fact is due largely to the yards being filled up with other types of carriers, but the ship builder finds in the present demand for bulk freight carrying tonnage, considerable encouragement for the future. Table II, page 44, giving the vessels under construction in American yards at the opening of this year, shows that lake yards have under construction 37 boats of more than 100 tons gross. Included in these are 10 bulk freighters, eight Welland canal size steamers which will operate in the Atlantic coastwise trade, seven vessels designed for foreign owners, six auxiliary schooners for ocean service, three trawlers, one surveying vessel and one fire boat. These figures do not include Canadian yards.

A comparison of these figures with the new construction program under way a year ago, brings forcibly to one's attention the wonderful revival of ship building along the Great Lakes. At the opening of 1915, lake ship yards were at work on a passenger steamer, three tugs and two dump scows. Only one bulk freighter was built last year, the contract being signed in March and the completed vessel turned over to her owners on Aug. 31. This freighter was W. F. WHITE, which was described in detail in *The Marine Review*, October, 1915.

In Table I, page 43, showing boats delivered or launched during 1915, the first effects on lake ship yards of the great influx of orders for ships that reached American yards last year is revealed. Five vessels of Welland canal size were built and delivered during the year. In the extensive construction of carriers for ocean service, the lake ship yards have entered a field which they had never seriously considered, but which promises to increase in importance. The size of the Welland canal, connecting Lakes Erie and Ontario, limits the vessels destined for salt water to about 253 feet length and 43 feet beam. This fact had effectually barred lake yards from competing effectively with builders along the coasts, although a number of vessels for coastwise service have been built on the lakes. However, the overflow from the eastern yards was quick to reach lake builders early last fall. It is interesting to note, not only the large number of vessels under construction for service on waters other than the Great Lakes, but the fact that seven of them are being built for Norwegian and Argentine interests. This entry of the lake yards into the construction of ships for foreigners promises to have far reaching effects on the future of lake ship building.

Another interesting order secured by a lake ship building company, was that for building six auxiliary schooners. The Toledo Ship Building Co. is now carrying out this contract, and will begin to launch these vessels in April. These boats will be sent to the coast under sail, and will be fitted out with auxiliary oil-burning equipment at some salt water yard. The one bulk freighter launched last year has a carrying capacity of 10,000 tons or about 200,000 tons in an average season of 20 trips. This addition to the bulk freighter fleet on the lakes is the smallest of any year since this type of vessel was first brought out. The construction of these vessels has been comparatively light for several years, but the orders placed during the past few weeks indicate that the surplus of ships brought out in the years preceding 1911, has been largely digested.

The solitary 1915 bulk freighter compares with six built in 1914; four in 1913; five in 1912; nine in 1911; 20 in 1910; 17 in 1909; 24 in 1908; 40 in 1907; 40 in 1906; 29 in 1905; 7 in 1904; 42 in 1903, and 32 in 1902. The carrying capacities of these bulk freighters, based on an average season of 20 trips, are: 1915, 200,000 tons; 1914, 1,020,000 tons; 1913, 560,000 tons; 1912, 960,000 tons; 1911, 1,100,000 tons; 1910, 3,890,000 tons; 1909, 2,816,000 tons; 1908, 2,028,000 tons; 1907, 7,220,000 tons; 1906, 7,620,000 tons; 1905, 5,204,000 tons; 1904, 1,026,000 tons; 1903, 4,265,000 tons; 1902, 3,438,000 tons. These figures reveal clearly the rapid increase in the carrying capacity of the bulk freighters. Since WOLVIN was built in 1904, only one vessel of less than 400 feet in length, has been built for the bulk freight trade of the lakes. All of the new vessels ordered this year are 600 feet in length. Since the appearance of WOLVIN, 38 vessels of the 400-foot class, 113 vessels of the 500-foot class and 32 vessels of the 600-foot class have been built.

Great Lakes Bulk Freighters

NUMBER AND CARRYING CAPACITY

Year	No. of vessels Jan. 1	Launchings, number	Subtractions, number	Carrying capacity, of new vessels, gross tons	Carrying capacity, subtracted, gross tons	Total carrying capacity, one trip, gross tons
1916	546	..	..	.....	.....	3,073,319
1915	546	1	1	10,000	3,104	3,066,423
1914	548	7	9	61,000	26,166	3,031,589
1913	572	4	28	28,000	120,919	3,124,508
1912	589	5	22	49,500	60,945	3,135,953
1911	592	5	8	55,000	29,477	3,108,330
1910	589	20	17	194,500	60,617	2,973,447
1909	587	17	5	157,300	37,197	2,853,344
1908	567	24	4	101,400	14,837	2,766,781
1907	542	40	16	368,000	46,973	2,442,754
1906	514	40	18	381,000	40,987	2,065,111
1905	518	29	33	260,200	114,374	1,919,285

Canadian Yards

The ship yards on the Canadian shores of the Great Lakes launched three vessels of more than 100 tons gross during 1915. The largest boat was ONTARIO No. 2, a car ferry, built by the Polson Iron Works, Ltd., Toronto, for the Ontario Car Ferry Co., Ltd., Montreal. The ferry is 318 feet

(*Concluded on page* 59)

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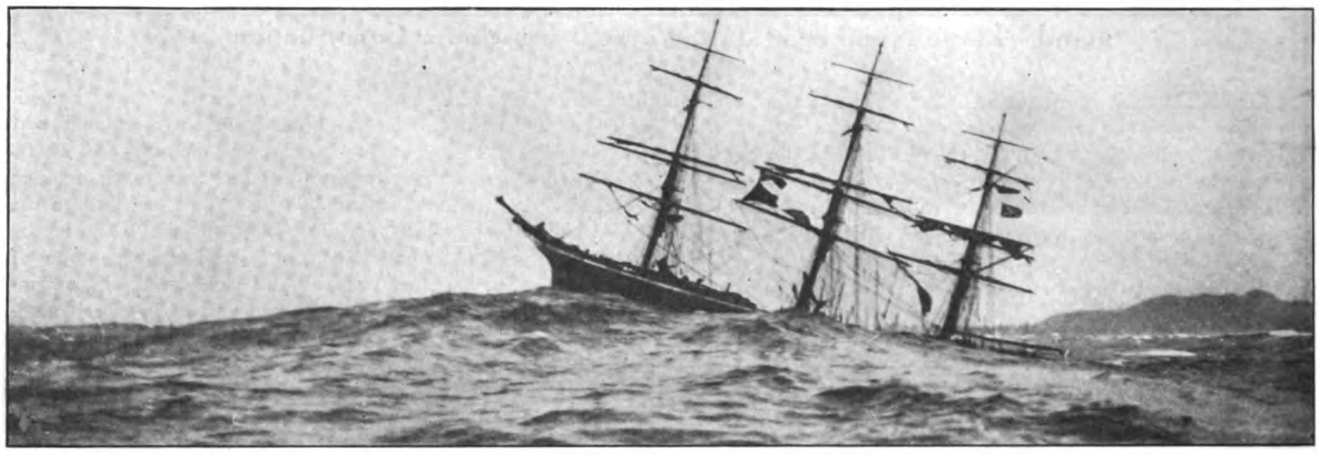
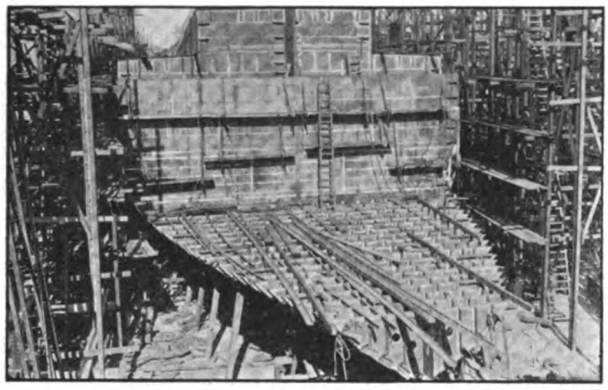
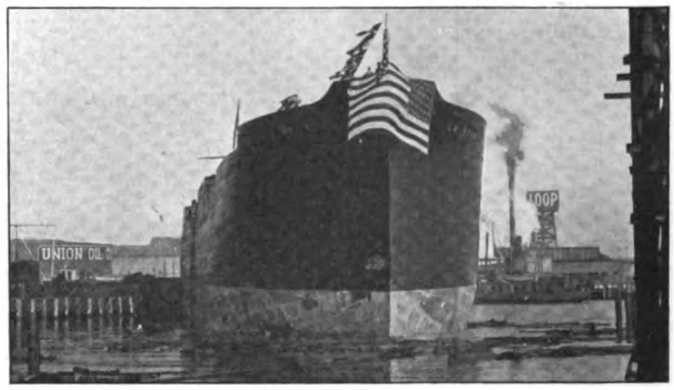


VANCOUVER ISLAND COAST, PACIFIC OCEAN GRAVEYARD, CLAIMS ANOTHER VICTIM

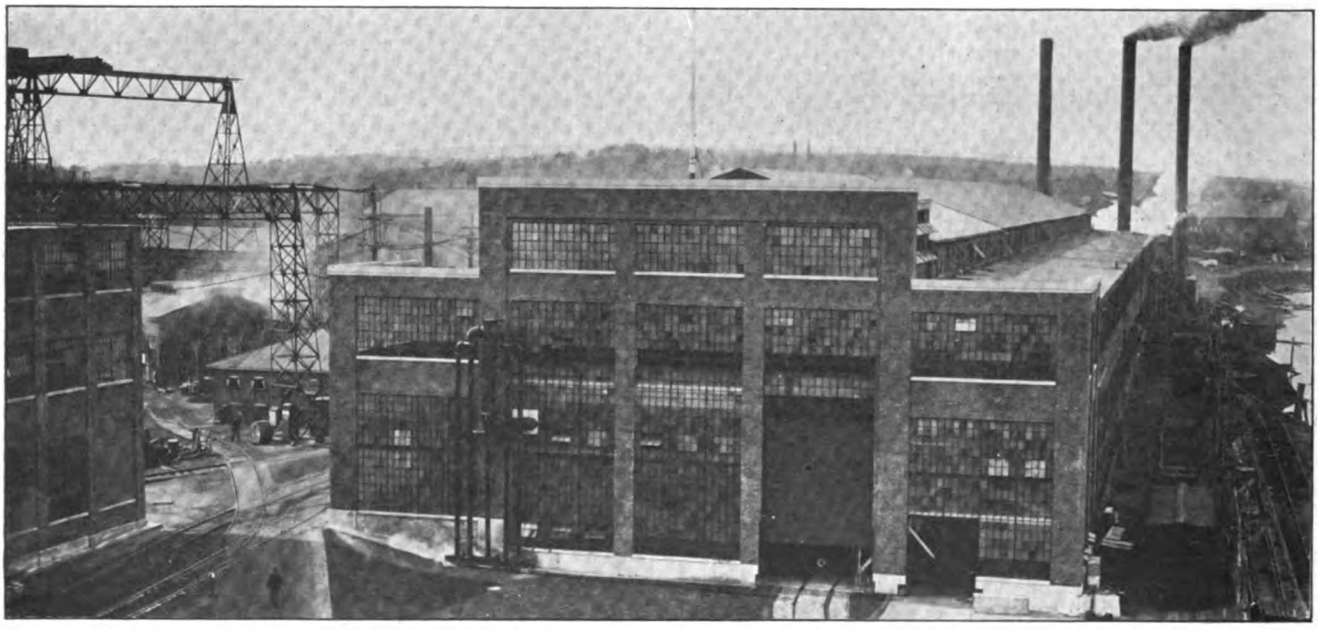
This remarkable photograph, taken from the deck of PRINCESS MAQUINNA, shows the death agony of CARELMAPU, a Chilean ship, on the reefs off Gowland rock, to the north of the straits of Juan de Fuca. Seventeen men, of a crew of 22, perished with their ship, which broke up a few minutes after the picture was taken. In spite of desperate efforts, PRINCESS MAQUINNA was unable to aid the doomed sailors.





PACIFIC COAST SHIP YARDS RUSH WORK ON NEW CONSTRUCTION

The renaissance of the American merchant marine now taxes the capacity of builders on both coasts. The Union Iron Works Co., San Francisco, has booked orders for several large ships, among which LA BREA, recently launched for the Union Oil Co., is notable. Little more than a month elapsed between the taking of the two photographs reproduced above.



A STRIKING EXAMPLE OF THE SHIP BUILDERS' FAITH IN THE FUTURE

Convinced that the cessation of hostilities will not cause a halt in the development of the new American mercantile marine, progressive builders are making permanent extensions to their facilities, as shown by this substantial new structure of the Fore River Shipbuilding Co., Quincy, Mass.

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Latest Marine News in Pictures

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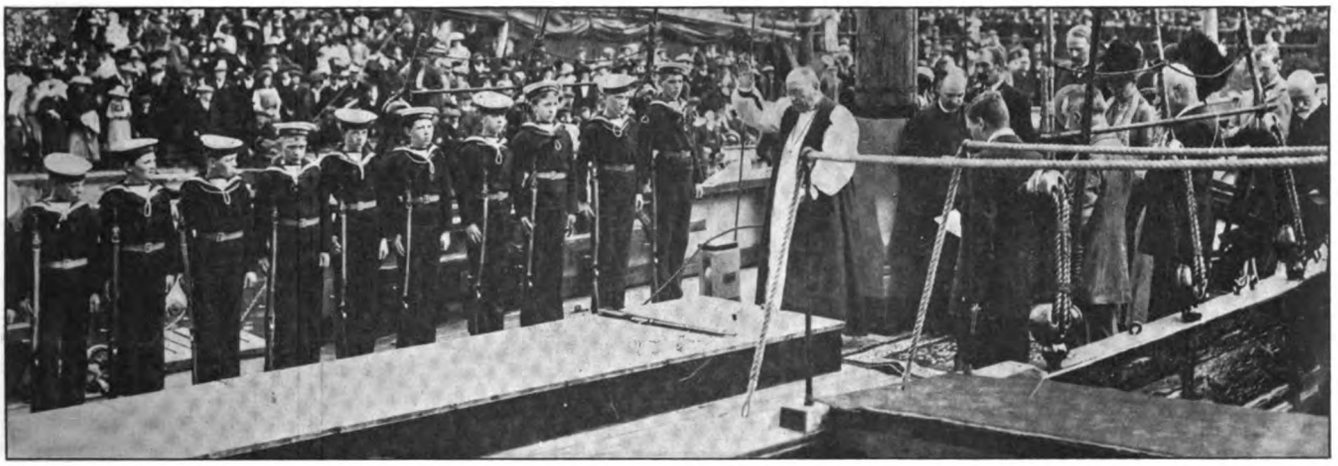
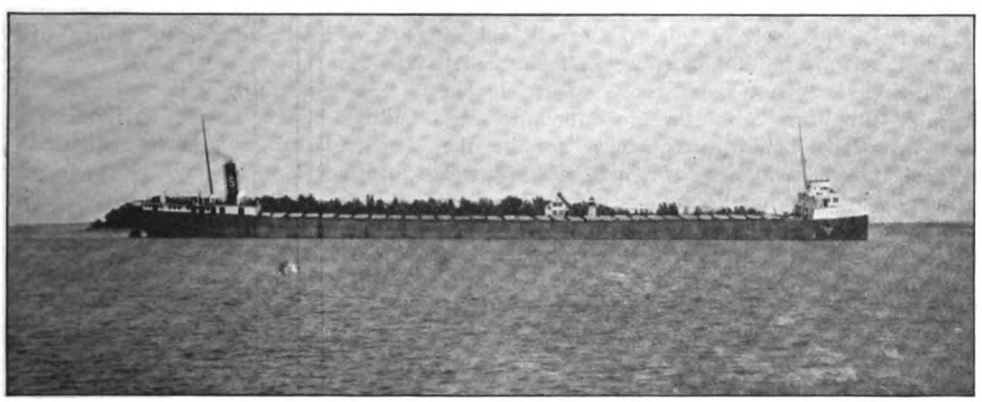


CONSECRATING THE YOUTH OF BRITAIN TO THE SOVEREIGNTY OF THE SEAS

This interesting photograph shows an impressive scene at Norwich, England, when the new training ship LORD NELSON was blessed by the Bishop of Thetford. English boys are taken into the navy at an extremely early age, and are trained in a rigorous school



A GREAT LAKES SOU'WESTER IS AN ADVERSARY WORTHY OF RESPECT

The gale which tossed the big freighter MATTHEW ANDREWS of the Kinsman Transit Co., Cleveland, ashore off Pipe Island, wreaked a similar fate on dozens of smaller fry all along Lake Huron and the approaches to the Soo. The illustration at the left shows the big 10,000-ton craft ashore with Pipe Island in the background. The smaller illustration shows the ship's heavy list to starboard.

BITING SNAGS OUT OF THE BIGGEST RIVER AND CHEWING 'EM UP

Here is one of the government's big snagboats on the Mississippi, with an old giant of a snag that has long worried navigators, finally hauled out between her double hulls for the coup de grace. It has been drawn up on the butting beam to be sliced by the steam saws

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A Big Year for the Pacific Coast

Establishment of Many New Coastwise and Transpacific Lines, Extension of Established Schedules and Boom in Construction Make 1915 Memorable

IN SPITE of the importance of war-time developments and of the effects of the seamen's law on transpacific commerce, the most memorable feature of the year 1915 in Pacific coast maritime affairs seems to have been the impetus given to American coastwise traffic by the Panama canal. The serious embarrassment which was occasioned by the Gaillard slides last autumn, brought home a realization of the tremendous importance which the canal had assumed within a few months. The development of our coastwise merchant marine during the past year was phenomenal, notwithstanding the shortage of bottoms caused by the war. Announcements of new lines through the great waterway, between Atlantic and Pacific ports of both the northern and the southern continent, appeared almost weekly; while increases in the schedules of lines already established, permitting them to take full advantage of the canal, were scarcely less frequent. This interweaving of commercial ties between the harbors of the western hemisphere, a process stimulated, of course, by the partial stoppage of European imports, is apparently only in its beginning.

Spectacular Results

The results of the seamen's law, which went into effect November 4, were far more spectacular on the Pacific coast than on the opposite shore or on the Great Lakes. The announcement made by officials of the Pacific Mail line, that the provisions of the law made it impossible for them to operate their ships at any margin of profit and that they would therefore dispose of their fleet and retire from business, created a sensation. The transference by Robert Dollar of his ships to Chinese and British registers for the same reasons, and the final sailing of the Great Northern liner MINNESOTA from Seattle to Liverpool to be offered for sale, were subjects of the warmest interest. Particularly striking at this time of troublous changes in American transoceanic shipping, was the advent of a new Chinese-American line, controlled by Chinese capitalists of San Francisco and the orient, and flying a Chinese house flag. The extension of the schedules of the Nippon Yusen Kaisha and the Toyo Kisen Kaisha, to take full advantage of the field left vacant by their Yankee rivals, was no less portentous.

In common with the Atlantic coast and the Great Lakes, the Pacific coast experienced a remarkable boom in the demand for shipping of all kinds, from the rickety old sealers which for years had rotted in Oakland creek, to the finest new tankers and package freighters which could be turned out at high working pressure by the Seattle Construction and Dry Dock Co. and other large yards. Vessels of every variety are still at a premium and the demand is increasing.

Dalles-Celilo Canal Opened

The opening of the great inland empire of the northwest to the coast by a direct water route was celebrated in May, with the dedication of the Dalles-Celilo canal, which permits the free navigation of the Columbia and Snake rivers for more than 1,000 miles. This canal parallels the Columbia river rapids for 8½ miles, with a total normal raise of 90 feet, and does away with the necessity for transshipment by rail of the valuable timber, grain, stock and fruit products of the upper Columbia and Snake valleys. Its economic value to the northwest is many times greater than its cost, $5,000,000.

The year also witnessed the completion of several noteworthy harbor improvements along the coast, including large docks at San Francisco, Astoria, Seattle and Tacoma. Work on the Lake Washington canal at Seattle, which, when completed, will connect a thirty-mile-long body of fresh water with Puget Sound, with sufficient depth to permit the entrance of the largest vessels, was pushed rapidly by the government engineers. Late in the autumn the announcement that the secretary of the navy had approved the plans submitted by the Union Iron Works for a mammoth dry dock at Hunters point, Cal., caused much enthusiasm in coast shipping circles. This dock, which will be completed in three years, is to be 1,000 feet long, 40 feet deep, and 110 feet wide, and will be capable of handling the largest battleship now afloat. Its estimated cost is $2,000,000, the navy department agreeing to furnish annually $50,000 worth of work in the event of its construction. Among notable harbor developments of the year was the construction by the Chicago, Milwaukee & Puget Sound, of a modern terminal, including a grain elevator, at Tacoma. This waterway is 1,000 feet long and 215 feet wide, with a minimum depth of 35 feet.

Several units of the port of Seattle harbor project were placed in commission during the year, including a large warehouse dock and a storage warehouse pier designed to handle perishables such as fish and fruit. This latter unit has a waterfront of nearly 1,200 feet, the warehouse being 422 feet long and 80 feet wide. It represents an investment of nearly $1,000,000. The port of Seattle also completed a public terminal grain elevator with a capacity of 500,000 bushels, which is said to be the first municipally owned utility of its kind in the United States.

The big south jetty which has been built at the entrance of Humbolt harbor, Eureka, Cal., was completed by government engineers after three years' work, costing $1,200,000. A similar jetty is now under construction at the north side of the entrance. Extensive improvements in the harbor facilities at Portland were also placed in service. Work has been commenced on new bulkhead wharves at Honolulu, which are designed to accommodate cargoes discharged at the rate of 2,400-3,000 tons in 24 to 36 hours. The old marine railway at Honolulu has been demolished to make room for modern improvements.

New Piers at Frisco

Two new passenger and freight piers were built by the San Francisco harbor commissioners for the Pacific Coast Steamship Co. Each is 680 feet long and 140 feet wide, the pier sheds being 100 feet in width. Among the features of these docks are passenger galleries communicating directly with the upper decks of the steamships, adjustable cargo aprons permitting the handling of cargo through side ports at all stages of the tide, and spur tracks communicating with the belt railroad. The $1,500,000 floating dryd ock at Prince Rupert, B. C., consisting of three units with a total capacity of 20,000 tons, was also completed during the year. This dock is so designed that all the sections may be joined to hold a vessel 600 feet long and weighing 20,000 tons.

The new public docks at Astoria, on the Columbia river, have 5,500 feet of

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waterfront, with fireproof masonry freight storage sheds and a coal bunker of 20,000-tons capacity. A large berthing capacity was built at Flavel, Ore., by the Great Northern Pacific Steamship Co. to accommodate its coastwise passenger traffic between that point and San Francisco.

The first months of the year 1915 were characterized by extreme dullness in shipbuilding and chartering. The revival came swiftly, however, and by early summer all the ship yards were working to capacity and the search for tonnage was at its height. It became necessary to press into service many old wooden sailing vessels which had been on the verge of following many of their predecessors into the limbo of barge existence. Fortunes were made in a few weeks by those fortunate enough to have any considerable carrying space at their disposal. The sales of railroad-owned Great Lakes vessels during the summer attracted Pacific coast operators hungry for additional tonnage, and several of the lake ships were brought through the canal for service between coast ports and Alaska.

Another interesting feature of the year was the development of a substantial carrying trade from Puget sound ports to Vladivostok, including not only the Imperial Russian Volunteer Fleet which is aided by the Russian government, but several private lines as well. Although the shipment of munitions and other necessities, which are cut off from Russia through former trade channels, is the principal business of the new enterprise, it is confidently believed that the business relations now being established in this way are the beginning of a large commerce between the Pacific coast and the Muscovite empire, via the Trans-Siberian Railway.

New Lines Organized

Many new lines were organized during the year to trade between Pacific coast ports, the orient and South America; as well as to the eastern and European destinations by the way of the canal. Among these is the Panama-Pacific line, operating KROONLAND and FINLAND between San Francisco and New York, and the Java-Pacific line, organized jointly by four Dutch steamship companies to maintain a service of four large vessels between the Golden Gate and the Dutch East Indies. No subsidy was granted this line by the Netherlands government. The China Mail Steamship Co., a $2,100,000 corporation, was organized by Chinese capitalists to inaugurate a line between San Francisco and Honkong. The first vessel placed in this service was CHINA, bought from the Pacific Mail line. The directors of the company announced their intention of adding to the service as rapidly as possible. Another Chinese-American line organized during the year was the Pacific & Eastern Steamship Co., with $2,000,000 capital. The lake steamships BINGHAMTON, MCCULLOUGH, OWEGO and BROWNELL were acquired by the Transport Service line, in whose formation the Dodge interests were concerned, for commerce between the Atlantic and Pacific coasts via the Panama canal. The Oregon-California Shipping Co. secured TAMPICO and EUREKA on time charter for freight service between New York, Philadelphia and San Francisco. The first ship of a line inaugurated by C. B. Sprague & Son between Boston and Seattle was INVERIC, a 4,800-ton vessel. The West Coast Navigation Co. operated three steamers for a short time between the two coasts, the service at length being suspended. Three separate freight lines were instituted by the Marine Transport Service Corporation of New York, one of which will ply to Pacific coast ports, another to South American ports, and a third at large. The Fred Olson Shipping Co., a large Norwegian concern, established a service from Norway to San Francisco and other Pacific coast harbors, five large new ships being available, at the latest report.

Additions to the schedules and increases to the fleets of established lines during the year were too numerous to mention in detail. As might have been anticipated, the great shipping interests of Japan were quick to take advantage of the conditions which caused the withdrawal of the Pacific Mail and Dollar lines from Pacific ocean commerce. With every shipyard in the Flowery Kingdom crowded to capacity, many and costly additions were made to the fleets of the Nippon Yusen Kaisha, the Toyo Kisen Kaisha and the Osaka Shosen Kaisha, and the services of these lines to the Atlantic and Pacific coasts of the United States, as well as to points which had previously been served by the defunct Pacific Mail line, were speedily augmented by new and fast steamships. Statistics published in preceding issues of *The Marine Review* indicate that Japan is endeavoring to make good her present supremacy on the Pacific, to the utmost of her ability.

Among the large British owners who are extending their Pacific commerce may be mentioned Houlder Bros. & Co. and the Bank line, both of London, which have announced plans for regular sailings from San Francisco to the far east. The Imperial Russian Volunteer Fleet now has a considerable number of vessels plying between Vancouver, B. C., and Vladivostok under the management of the Canadian Pacific railway. Frank Waterhouse & Co., Seattle, chartered 11 steamships during the year for their Seattle-Vladivostock service, and the East Asiatic Co., Copenhagen, also placed the Siberian port on its Pacific schedule. The Transports Maritimes, Marseilles, inaugurated a 30-day service to San Francisco via the canal. W. R. Grace & Co. made several increases in their South and Central American itineraries, now having eight vessels plying as far south as Talchahuano, Chile. The Southwestern Steamship Co. chartered the Grand Trunk Pacific steamship PRINCE ALBERT for service between San Francisco and Mexican west coast ports. The Alaska Steamship Co., Seattle, purchased the former Great Lakes vessels BURLINGTON and BENNINGTON for its Alaska schedule. A semi-monthly service was commenced beteen Puget Sound and southern Alaska by the Independent Steamship Co., the first vessel on the run being ALLIANCE. The American-Hawaiian Steamship Co. and the Luckenbach Steamship Co. increased their fleets materially during the year, and even greater extensions are planned for 1916. Dodwell & Co. returned to the Alaska trade after a decade in which they operated no ships on that run, by purchasing a controlling interest in the Northland Steamship Co. Several great European owners sent vessels to the coast on tentative trips to secure data as to the advisability of inaugurating a regular service from San Francisco or Puget sound to the orient, and nearly all of them announced that such a service would be undertaken during the coming year.

Features of Interest

A detailed summary of marine construction in Pacific coast ship yards during 1915 is published elsewhere in this issue of *The Marine Review*. At the present, time practically every builder has deliveries booked into the future and is compelled to turn away business. One of the most interesting vessels launched during the year was BUSHNELL, a 350-foot submarine tender of 3,580 tons displacement, built by the Seattle Construction & Dry Dock Co., Seattle, for the United States navy. The year was also characterized by considerable activity in the construction of small commercial craft for diesel power installations, a noteworthy example being CHICKAMAUGA, built by Nilson & Kelez, Seattle, for the Pacific Towboat Co., which is said to be the first diesel-powered tugboat in the United States. An undertaking of great commercial importance was initiated by the federal coast and geodetic survey department, which chartered the famous Arctic schooner KING & WINGE to complete an exhaustive wire drag survey of Alaskan waters. Numerous pinnacle rocks and other menaces to navigation were discovered in the early stages of the survey.

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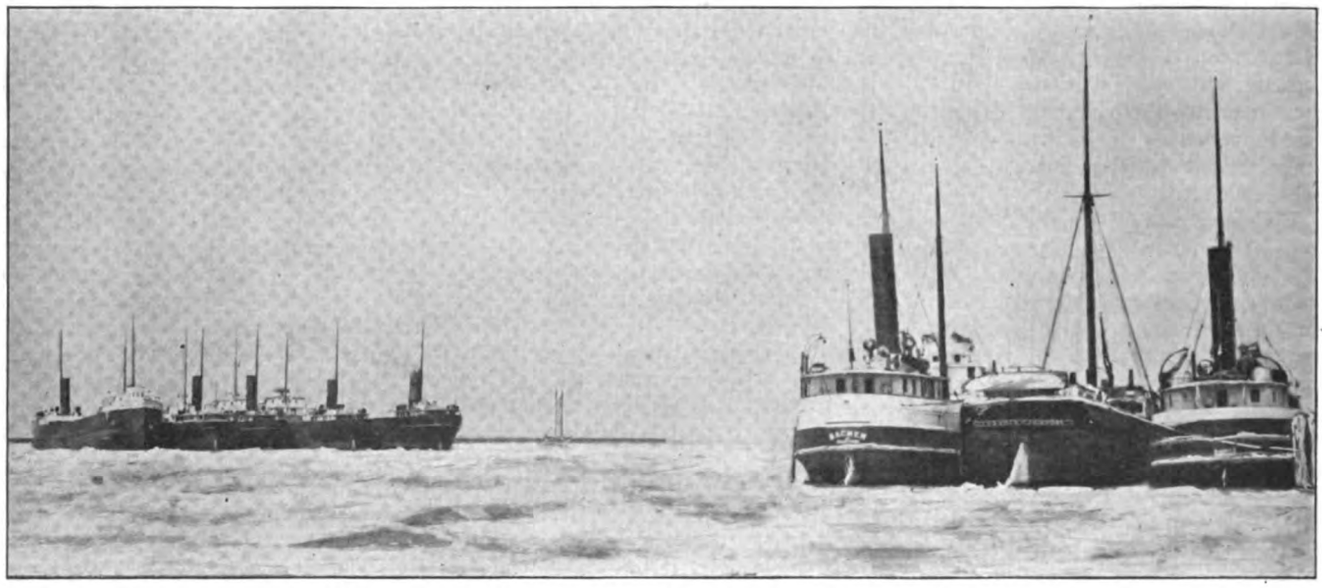

Fig. 1—Great Lakes Freighters Laid Up for the Winter in Cleveland Harbor

How Lake Freighters Are Laid Up

A Description of the Methods by Which Executives of Cargo Fleets Refit and Repair Vessels and Purchase Supplies During the Winter Season

By F. A. Churchill Jr.

SINCE days of old, when the powder burned tars of CONSTITUTION'S crew, side by side with Great Lakes lads, worked the guns on the battered decks of the old NIAGARA and LAWRENCE, a certain rivalry has existed between salt and fresh water sailors. Does the presence of sodium-chloride in the element which buoys a ship, or the fact that Europe, instead of Ontario, lies beyond the blue horizon, constitute a ground for superiority, or not? Many a seadog, possibly a little out of temper with the unaccustomed idleness of a smoking car seat on a Lake Shore flyer, has sneered disdainfully at the apparent emptiness of the vista. "Liners! Windjammers! Tugs! Mosquito craft! Where are they? Only three hulls sighted since we left Cleveland. Great Lakes! Why, shiver my timbers, they haven't any shipping at all!"

Could one of these disgruntled tars witness the endless procession of tall ships passing through the Soo; could he see the mighty fleets discharging wheat at Buffalo or iron ore at Conneaut or Ashtabula, he would entertain a different and more respectful opinion of Lake maritime activities. A glance through the 1915 *Red Book*, with its lists of the hundreds and hundreds of big freighters which ply those same lakes, supplying the nation and the world with the vital elements of the two prime necessities, iron and breadstuffs, would modify his views to an even greater degree. And did he know that these hosts of ships are active but seven or eight months in the year, being moored snugly behind ice-shrouded breakwaters or in frozen rivers all the rest

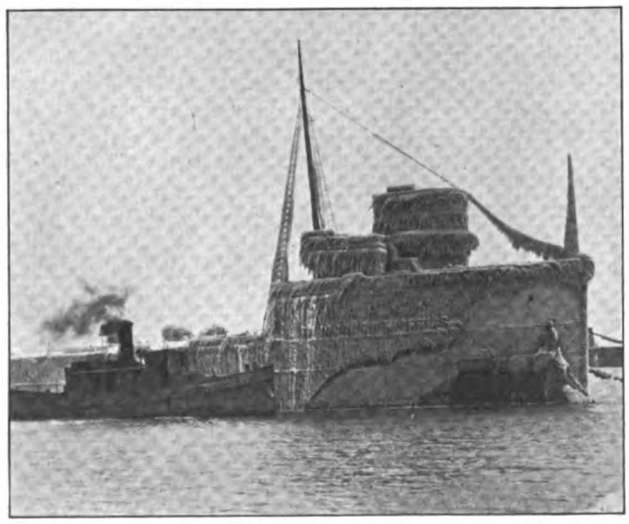

FIG. 2—A SNUG BERTH FOR THE WINTER

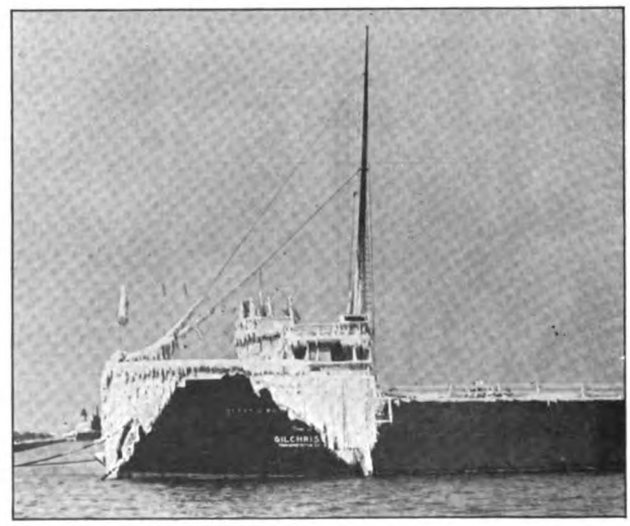

FIG. 3—BEHIND BUFFALO BREAKWATER

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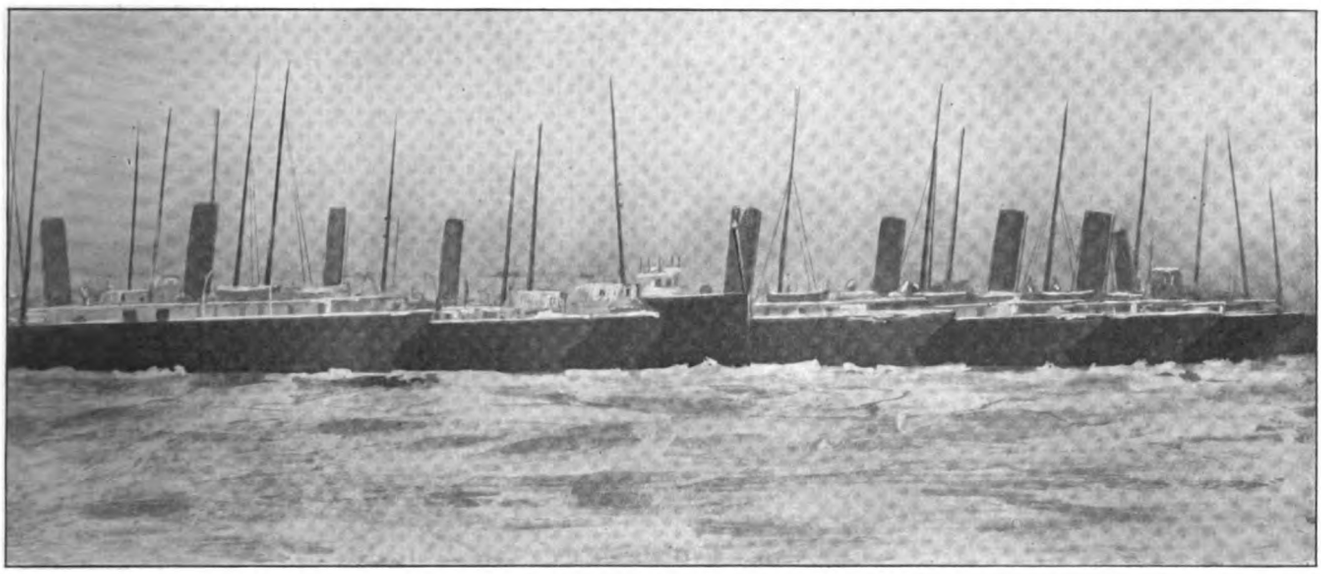

FIG. 4—SAFELY MOORED BEHIND A MASSIVE BREAKWATER, THE LAKE FLEETS WAIT FOR SPRING

of the time, he would wonder still more at the royal prodigality of revenue which can afford to augment their ranks with dozens of new ten-thousand tonners after every busy season.

The idea of laying up a great ship from December until April, with its attendant overhead expense—to use a landsman's term—as well as the idleness of the invested capital, is unfamiliar to the ocean sailor. A certain simple law of chemistry, by which salt lowers the freezing point of water, he takes for granted. Years of experience, however, have taught his Lake brother to make the best of the situation and to turn the winter to advantage. Compelled to work his boats to the maximum during the open season, he finds in the frozen months an excellent opportunity to take stock of their condition and make all necessary repairs and renewals according to a regular routine, so as to be ready for hard work the moment the waterways are once more clear for commerce.

Iron ore, coal and grain are the principal commodities freighted on the Lakes. A considerable amount of package business is handled, but this is small in comparison with the bulk commerce. The draft possible in the canals and rivers which connect with the several Lakes, the necessity of loading and discharging huge quantities of cargo in a minimum time and the character of the seas encountered, as well as other factors, have evolved a distinctive type of shipping. The modern lake freighter by no means suffers in contrast with her cousin, the ocean going tanker or collier. Limited to a draught of not more than 19 feet, she is often 600 feet in length, with a cargo capacity of approximately 12,000 tons. Her sides are sheer, her bilges extremely sharp, and her bottom nearly flat. The engines and boilers are situated far aft —a practice, by the way, coming more and more into favor in the design of ocean carriers—and practically the entire deck is an expanse of sliding hatches. Forward rises a tall forecastle, containing crew accommodations, sometimes with passenger suites above.

FIG. 5—CAR FERRY BUCKING THE ICE

By means of specially designed loading docks at the upper Lake ports, often of enormous capacity, the freighters take on their cargoes in a few hours. Automatic unloading devices at the discharging docks remove the ore in a similarly short time. Figs. 6 and 7 show the grab bucket or "business end" of one of these devices at work in the holds, one of an older type vessel and the other of a modern ship. It is interesting to note that in the latter craft, the stanchions and stringers which so handicap unloading operations in the older boats, have been entirely eliminated, a strong and simple arch construction having taken their place. Owing to the great length of Lake bulk carriers and the character of the cargoes carried, loading and unloading must be accomplished with extreme care, in order that no uneven distribution of weight shall strain or buckle the hull. A compartment water ballast system is utilized, the floor of the cargo hold forming the tank top. Such ballast is indispensable, as in many cases vessels are compelled to make a return voyage to the loading port without cargo.

The heavy ground swells and mountainous seas of the ocean do not enter into the reckoning of Lake designers and sailors. Therefore, an extreme of width and shallow draught in proportion to length may be attained, to secure the full advantage of

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the existing canal depths. Lake builders freely admit that one of their big modern ore carriers would have short shrift on the Atlantic. Subjected to the terriffic strain of being poised on two or three wave crests, she would buckle and collapse in no time. This constitutes no disparagement, however, on the soundness of her lines nor the excellence of her construction. The typical Lake sea is short, choppy, and extremely vicious. More than one sturdy ship of salt water origin has foundered in a Lake gale; while numerous Lake craft have proved their worth in ocean commerce.

Another feature of Lake ships which would excite the interest and doubtless the envy of coast sailormen, is the absence of brass and heavily galvanized fittings. The corrosive action of the water is practically negligible. Barnacles and teredos are, of course, unknown. A ship which has not visited the drydock for years may show only the faintest trace of vegetation on her underbody.

The tramp freighter is a minor element on the Great Lakes. The largest fleets are those owned and operated by the several great steel manufacturing interests; while others exist as independent factors. The size of the fleets varies from three or four ships to seventy or more, and the individual capacity of the ships from 2,000 to 12,000 tons. Practically all new construction is of the larger type, the advent of which has made freighting with vessels of limited tonnage almost unprofitable.

The big ore fleets are supervised, as a general rule, by a fleet captain or superintendent, and a fleet engineer. These men are responsible for the upkeep and satisfactory operation of the vessels and oversee their laying up and fitting out during the winter season.

Practically all commerce on the Great Lakes is at a close by Dec. 12 each year. The masters then bring their ships into the port which is to be their home until the resumption of operations in the spring. If extensive structural, boiler, or engine repairs are to be made, the vessel is moored as close as possible to the yard or shop which is to do the work. Otherwise, she may be anchored in any one of a dozen harbors from Duluth to Buffalo.

Mooring is accomplished either in a waterway, such as a river, or behind a breakwater, few Lake ports possessing natural shelter such as is found on the ocean coast. In mooring a ship alongside a river dock, she may be made fast at bow and stern by means of cables attached to "dead men" ashore, or lacking these facilities, her anchors may be taken ashore and buried, the slack in the chains being drawn up by deck engines. A similar practice is followed in mooring alongside a breakwater. Sometimes one of the bow anchors is unshipped and lashed in its port, the chain being taken aft and used as a mooring cable, few Lake ships possessing both bow and stern anchors. In cases where several vessels are laid up side by side in a harbor, they are generally so disposed as to head in alternate directions. The bow or stern, as the case may be, is secured to posts on the breakwater. Two anchors at the opposite end of the craft are carried out by tugs and dropped at angles of possibly 20 degrees with the ship's axis. The slack is then taken up by means of steam windlasses and the gear snugged down for the winter. The absence of tides or ground swell makes this operation comparatively simple. During the memorable November storm of 1913, however, in which many ships perished on the Great Lakes, several craft so moored were wrecked. Sometimes a group of vessels is lashed together in a unit by cables from one to the next, at bow and stern, as shown in Fig. 1. This illustration, as well as Figs. 4 and 10, is reproduced through the courtesy of *The Cleveland Leader*.

Methods of inspection to determine the extent of repairs and renewals necessary at the end of the season vary widely. In the case of the Pittsburgh Steamship Co., a subsidiary of the United States Steel Corporation, operating the largest fleet on the Lakes, the captains and chief engineers of the ships are required to fill out lists of the repairs needed, near the end of the active season. A little later, a committee, including the assistant general manager of the company and the various heads of departments, journeys to the Sault Ste. Marie canal and goes over each vessel as she passes through the waterway. A physical inspection is made, and the recommendations of the ship's officers are checked up for approval. Directions are then issued for laying up, the choice of harbor being made, as before stated, with reference to the proximity of shipyards or machine

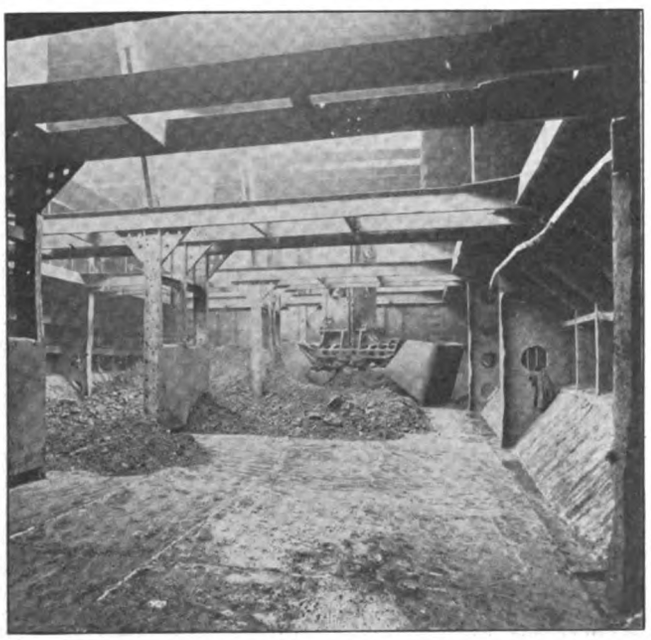

FIG. 6—HULETT UNLOADER IN HOLD OF OLDER TYPE FREIGHTER

FIG. 7—UNLOADER AT WORK IN LARGE MODERN FREIGHTER

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shops. Large structural or boiler repairs are handled by contract, while lesser work is issued by requisition.

It must be remembered that only such repairs and readjustments as do not seriously impair a vessel's efficiency are permitted to go over into the winter. The very fact of the working season being so short and requiring activity at full pressure necessitates that such wear or damage as affects the ability of a ship to work at her maximum normal speed or to handle cargo with the greatest celerity, shall be made good as soon as possible.

Continuing with the description of Pittsburgh Steamship Co. methods, which may be taken as standard practice, as soon as a vessel is safely moored, her captain sets his mates to work on the lay-up job. The crew typical large freighter consists of two assistant engineers, three oilers, and from four to six firemen, are hard at work. The combustion chambers under the boilers are scraped and picked clean and free of rust; they are also covered with a protective layer of paint or black oil. The inside of the boilers is similarly treated. All drainage plugs are taken out and every drop of water removed from the water and steam pipes. The engines are overhauled, pistons, rings, stuffing boxes and bearings being examined and, if necessary, removed for repair or renewal. All bright work is painted with a protective covering of oil or with a white lead mixture. Such parts as need attention are sent to the shops. The crank pit and the boiler pans under the fire room floor are also cleaned, scraped, and painted. engineers make their inspection tours during the last few days of the season, when the vessels are in harbor at the lower lake ports discharging cargo. In some cases, the filling out of repair blanks by the ship's officers is supplanted by a personal conference.

Hutchinson & Co., large Cleveland operators, have worked out a systematic method of inventories and reports on their vessels' condition, which, while similar to that used by a number of other large lake fleets, contains distinctive features. Large note books with printed topic headings to cover every part of the equipment are sent out to captains and engineers during the latter part of the year. The engineer's inventory and a report on condition of machinery and boilers and recommended

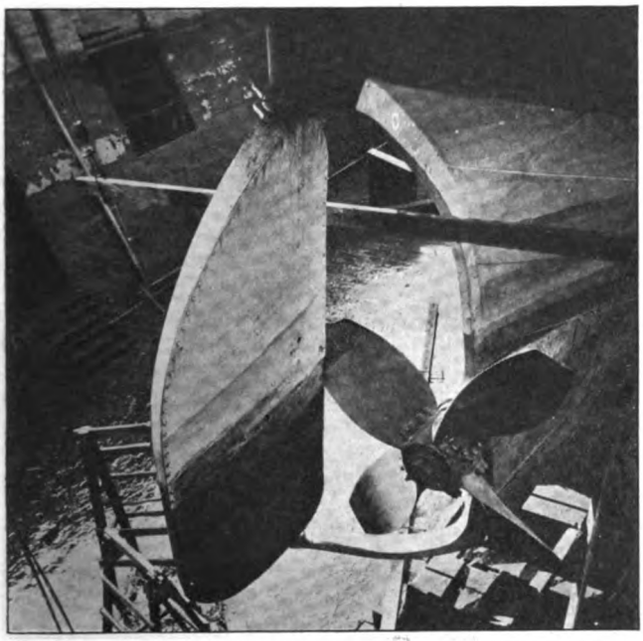

FIG. 8—SHOE AND RUDDER OF FREIGHTER DAMAGED BY GROUNDING

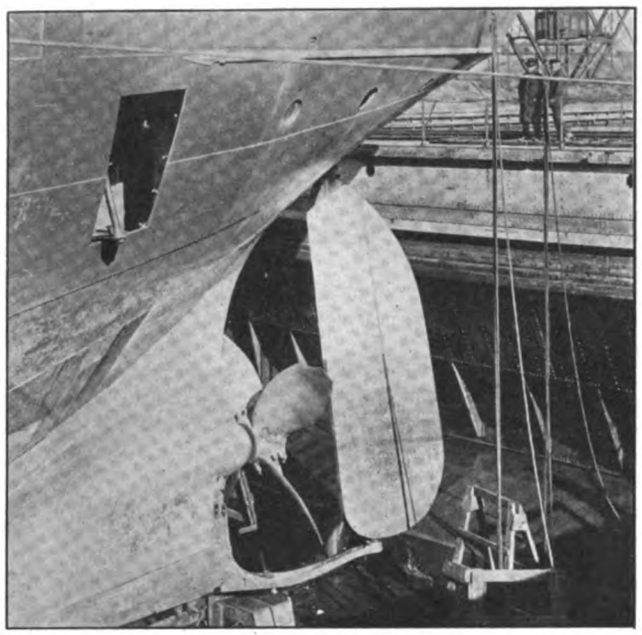

FIG. 9—PORT SIDE OF DAMAGED SHOE AND RUDDER

generally includes two mates, four wheelsmen, from four to six deckhands, and three men in the steward's department. All deck gear is removed or snugged down, the boats being turned over and lashed tight, and the ventilators, fire pails, racks, and other movable equipment being stored in the dunnage room after a thorough cleansing. The cargo hold is swept and scrubbed until it gleams. The forward end is then attacked, all movable furniture, bedding, linen, etc,. being gone over and listed as to condition, after which it is covered, wherever necessary, and stowed away. The steward and his men are meanwhile busy in the galley and mess room, not a utensil escaping their notice.

In the after end of the ship, the engineer and his crew, which in a When both departments have finished their labors, it will be seen that, except for the replacement of pieces removed for repair, the receipt and disposal of new supplies ordered through the purchasing department, and whatever attention may be required in drydock, the ship is practically ready for the next season. This method is followed by a majority of the fleets. Some, however, release their crews as soon as the hold, forward end, deck, engine and boiler rooms have been placed in serviceable shape for the winter, and leave the bulk of the work until the outfitting season. Many fleet superintendents keep a small gang of men on hand for a considerable time, replacing repaired parts as fast as they are sent back from the repair shop. Not a few fleet captains and engine and boiler repairs, devised by Anton Rud, chief engineer of the Hutchinson fleet, affords a good illustration of this system. The records thus maintained form a serviceable means of ascertaining the life of verious parts and the permanence of repairs, incidentally permitting the executive staff to gage definitely the comparative merits of the several firms doing the work.

The inventory includes notes on the condition of boiler room and incidental tools and equipment, electrical equipment, engineer's tools and sundries, oiling devices, packing, gaskets, rubber valves, hoisting equipment, machinery and pump fittings, metal valves, pipe fittings and bolts oil, dope and graphite, tanks, cans and lamps, paint and brushes, wrenches and eye bolts, etc. A sec-

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FIG. 10—TUGS MOORED FOR THE WINTER. THESE STURDY LITTLE VESSELS ARE THE LAST TO LAY UP FOR THE SEASON

tion is also devoted to recommendations for repairs. Such suggestive page-headings as the following are reproduced:

"Repairs and alterations to main engine, engine foundation, air pump, reverse engine, driving bearing, stern and propeller.

"Repairs and alterations to boilers, including breeching, draft system, heaters and purifiers.

"Repairs and alterations to windlass engine, mooring engines, hatch engine and capstan engine."

The supplemental report goes even more into detail, regarding the condition of the boilers and engines. A preface states that "as it is impossible to maintain an absolute line between what should be reported by the master and what by the engineer, they should confer on such items as might properly be reported by either one of them, and see to it that such item is reported by one only. This report is not to refer to small items which are properly upkeep, and should be cared for currently during the season and under no circumstances left for winter or fit-out work."

Methods of Ascertaining Condition

A few of the headings in the supplemental report may be of interest as indicating the extreme care exercised by a modern lake fleet in the maintenance of its units. For instance:

"Crossheads.—In what condition? Describe whether or not there are any cracks in the casting, loose pins in the crossheads, cut or cracked brasses or pins.

"Main Engine Crank Shaft.—In what condition is the babbitt in the respective bearings? Are there any loose pins or webs? What are the conditions of the bearing surfaces of the pins and shaft?

"Combustion Chamber.—In examining for internal pitting and growing, pay particular attention to the heel of the front and back head flanges and the turn of the combustion chamber flanges.

"Boiler Shells.—State specifically the condition of the girth seams, and whether or not there is any leakage or moisture tending to corrode the shells or rivets."

Every item of equipment is similarly discussed beyond the possibility of omission.

An interesting method of preparing the hoisting, mooring and other auxiliary engines for the winter is in use on vessels of the Hutchinson fleet. Formerly, the cylinder heads were removed and the inside of the cylinders painted with heavy oil to protect the surfaces. At present, the engines are started running and a heavy mixture of oil sent through them until they are thoroughly coated with it. The lines are then disconnected and the engines drained. This is declared to be much simpler than the old method, and equally efficacious.

Causes of Structural Damage

Structural repairs to Lake freighters are principally the result of such damages as have been sustained in the course of unloading by means of automatic devices. Fig. 6 shows clearly the effects of repeated battering by the big grab buckets in a small and "cluttered" hold. An interesting comparison is afforded with the same type of buckets at work in the hold of a modern freighter, shown in Fig. 7. The hold stanchions and stringers, in Fig. 6, are bent and twisted and the bilge ceiling and tank top are scored. The vessel illustrated has not been seriously damaged; but such usage occasionally necessitates the repair or replacement of structural members. Ships are seldom strained by improper loading or discharging; but grounding and collisions with docks are more or less frequent, and necessitate the same sort of repairs as do mishaps of the same sort on salt water, grounding being rather more recurrent, owing to the small margin

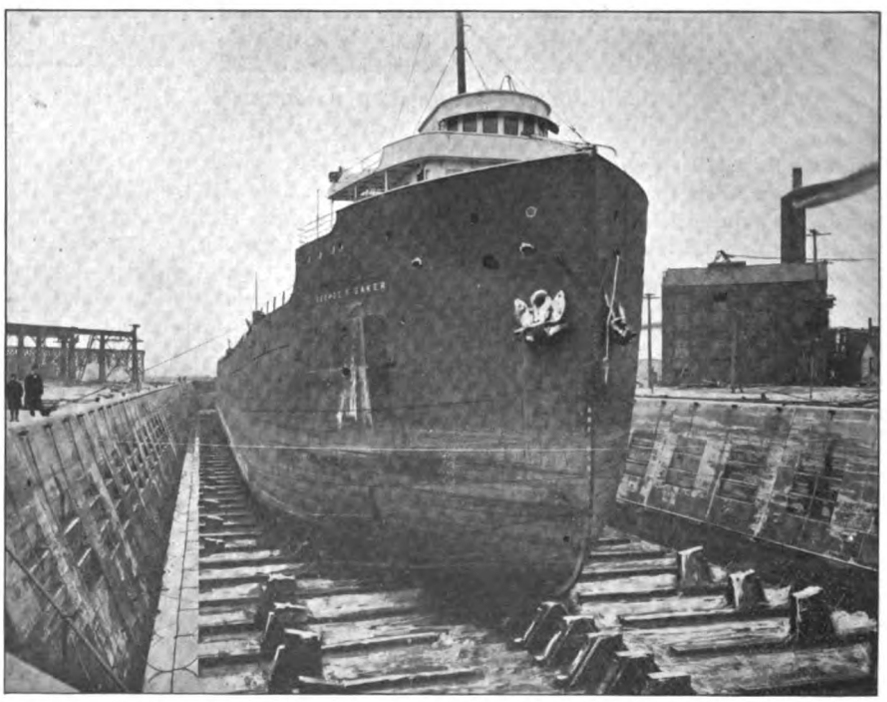

FIG. 11—NEW SOUTH CHICAGO DRYDOCK OF THE CHICAGO SHIPBUILDING CO.

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of draft available. A case in point was the stranding of half-a-dozen or more freighters in the St. Clair river last summer.

The stern bearings, which consist of cast iron tubes filled with lignum vitae, must be repacked at intervals of from three to five years. Anti-fouling paint is, of course, an unnecessary quality, but the hull and upper works must be gone over regularly as elsewhere.

The seaman's law at the present time is causing some little activity in Great Lakes shipyards. Many vessels lack the necessary accommodations for the augmented crew which is required under this law. Some of them, accordingly, are having extra crew space provided, at the cost of passenger room forward. Others, in which the space between the cargo hatches permits, now boast of deck houses 12 to 16 feet wide to house the additional A. B.'s.

The volume of repairs and new installation is heavier this season than ever before, not only on account of a prosperous year following several lean ones, but also because the steamboat inspection service is said to have stiffened materially in its requirements of late. As the coming season promises to be the busiest on record, so, it appears, the fleets will be in better shape than ever to handle it.

One of the biggest and newest drydocks on the lakes is shown in Fig. 11. This is the South Chicago dock of the Chicago Shipbuilding Co. It is 734 feet in length, 103 feet wide at the top and 88 feet wide at the bottom, with a depth of 22½ feet. The vessel shown is one of 11,200 tons cargo capacity, and illustrates graphically the peculiar lines of the modern lake freighter. Figs. 8 and 9 illustrate injuries to a ship whose shoe and rudder were hopelessly injured by grounding. These parts were so badly bent and sprung that it was necessary to replace them. The work was done at the dry dock of the Great Lakes Engineering Works, Detroit.

When the long period of enforced inactivity is over and the breaking up of the ice in the waterways apprises the fleet executives that navigation will soon be possible, the masters and engineers are apprised, and gathering their crews, set out from their homes in the various lake ports to wherever their ships may be moored. The fitting-out season proper, in most cases, is devoted merely to the removal of fittings from their respective dunnage rooms and their re-disposition on deck, in the living quarters or wherever else they may belong, and the freeing of the engines and boilers from their protective coatings, preparatory to firing up. New supplies are checked over and stowed away, coal is taken aboard, and the ship is once more ready for hard work.

Like the "rest periods" advocated by many scientific management experts for factory operatives, the laying-up season, despite an unavoidable loss of working time, affords a first-class opportunity for owners and managers to take stock of their floating resources and keep them up to the zenith of condition. Irrespective of climatic and physical circumstances, a comparison of the "working-day" lives of ocean and lake freighters would possibly reveal the fact that the frozen winter of the Great Lakes is not such a financial hardship as it might appear at first glance.

On Great Lakes in 1915

(*Concluded from Page* 49.)

in length with a carrying capacity of 5,567 tons. The Collingwood Ship Building Co., Collingwood, Ont., launched the tanker ROYALITE, 258 feet in length and 2,740 tons carrying capacity, for the Imperial Oil Co. of Canada, and a hopper barge, 187 feet in length and 800 tons capacity for the Canadian government.

The Collingwood yard had under construction on Jan. 1 three vessels of more than 100 tons gross. Two boats are tankers for the Imperial Oil Co. of Canada, each being 258 feet in overall length, 43 feet beam and 18 feet depth. Their carrying capacity is 2,740 tons. The third vessel is a bulk freighter, 550 feet in length, 58 feet beam and 31 feet depth.

Assembly Rooms Open

The assembly rooms maintained in the various ports by the Lake Carriers' Association are now open for the convenience of the men employed on Great Lakes vessels. These assembly rooms have done much to develop a spirit of comradeship among the men and to introduce a state of social intercourse hitherto unknown. They have also been a source of real help along educational lines. Night schools are conducted and classes in seamanship are maintained in the afternoons in a number of the rooms. On Jan. 3 a school in navigation and marine engineering was opened in special quarters in the Perry-Payne building, Cleveland, entirely free to sailors having record books showing actual service. Applications for entrance to these schools should be addressed to George A. Marr, secretary, Lake Carriers' Association, Cleveland, O.

Captain Vessey Dies

Captain William Vessey, for many years connected with Great Lakes vessel interests, died Dec. 29, 1915, at the age of 84 years. Captain Vessey was born in Lincolnshire, England, and sailed on salt water for seven years. He made his first trip to the Soo in 1849, and in the early days was captain and owner of the following boats: BRANT, RUSH, GORDON, JERRY, SNOW BIRD and EMPIRE.

Ship Yards Need Men

Following a canvass by the New York Chamber of Commerce of 30 ship yards in the United States as to available capacity for creating a merchant marine, representatives of two of the largest plants on this side of the Atlantic declared recently that no new contracts for ships could be accepted by them for delivery within two years, and probably long after.

An extraordinary condition in the labor market was given as the cause. There is, they said, a scarcity of expert mechanics such as makes impossible any immediate elaborate plan for "putting the American flag on the seas," no matter how favorable the sentiment.

For some of this labor shortage they blamed the "political management" of the navy yards, by which private firms are "robbed" of their help, and for the rest they held the indifference heretofore entertained by the public for a merchant marine to account. But in any event, they emphatically insisted, no matter what action congress or private capital might contemplate, it would take years to build up a necessary fleet of sea-going craft, owing to a lack of skilled workers.

Only one ship yard official among many interviewed was found who held a more hopeful view of the situation. This man, who is the vice president of a corporation of world-wide reputation, said he could accept contracts for delivery early in the summer of 1917, but he admitted his position was unique.

The inquiry directed by the New York chamber of commerce developed that if demand justified it, the plants could enlarge their capacity from 15 to 60 per cent.

The Suez Canal Co. has informed the American embassy at Paris that canal tolls will be raised 50 centimes (9.6 cents) on and after April 1, 1916. The new provisions make the rate for laden ships 6 francs 75 centimes ($1.30) and for ships in ballast 4 francs 25 centimes (82 cents) per ton.

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Lake Vessel Accidents During 1915

Twelve Total Losses and Three Constructive Total Losses Recorded — Except for Eastland Casualties Were Few

DURING the season of 1915 on the Great Lakes, 12 vessels were lost; eight were steamers, one was a schooner, one a barge, one a tug and one a dredge. Five vessels out of the 12 were destroyed by fire, five foundered, one was sunk through collision and one was wrecked when she ran ashore.

In addition to the 12 total losses, there were three constructive total losses, consisting of the steamers IOWA, LACKAWANNA and WESTERN STAR. IOWA of the Goodrich line was crushed in an ice jam off Chicago harbor on Feb. 4, carrying down a cargo of general merchandise valued at $200,000. She was covered by $60,000 insurance. A contract to raise her was given the Great Lakes Dredge & Dock Co. in May and she was subsequently floated. LACKAWANNA, owned by the Buffalo Transit Co., Buffalo, ran ashore on Gull Island Reef, Lake Michigan, Sept. 23. She was abandoned by her owners as a constructive total loss but was released Sept. 29 and later docked at Manitowoc. The steamer WESTERN STAR, operated by H. K. Oakes, Cleveland, stranded in thick weather on Robertson Rock, Georgian Bay, and was abandoned by her owners as a constructive total loss. She was insured for $200,000 and was released later by the Great Lakes Towing Co. Exclusive of the apalling loss of life through the EASTLAND disaster, which occurred July 24 at Chicago, when approximately 800 persons were drowned, the number of lives lost through accidents during the year totaled 18. Four were lost on the sandsucker JUNIOR, which hit the breakwater at Cleveland on May 9 and sunk; two men were killed by an explosion of a gas tank on the steamer THOMAS WALTERS at Duluth on June 30; two on the tug SANDUSKY when she turned turtle near the entrance to Sandusky bay on Aug. 10; one man on the barge ONTARIO when the boiler head blew off; five when the schooner CITY OF SHEBOYGAN foundered on Lake Ontario on Sept. 25, and five on the tug FRANK C. BARNES, which foundered on Lake Ontario about Nov. 10.

Half Year Record of Accidents

A record of accidents from Jan. 1 to July 1, 1915, was published in the August, 1915, issue of *The Marine Review*. A summary of those occurring from July 31 to Dec. 31 follows this article. Low stages of water were more or less prevalent throughout the year, and caused quite a number strandings, particularly between Nov. 13 and 15 when over ten vessels stranded in the St. Clair river, and on Nov. 29, when the steamer CALDERA went aground, blocking the passage for about 25 freighters. Approximately 90 vessels either ran aground or went ashore, while ten were damaged by fire, 14 damaged through collision and several met with mishaps owing to disabled steering gear.

Among the more serious collisions was that between the steamers CHOCTAW and WAHCONDAH on July 12. These vessels collided in thick fog on Lake Huron, off Presque Isle, CHOCTAW sinking in 200 feet of water 22 minutes after the impact, while WAHCONDAH'S bow was badly damaged, making it necessary to dock her for repairs. The steamer F. T. HEFFELFINGER collided with the steamer ALLEGHENY during a heavy fog in the Detroit river, resulting in a repair bill for the HEFFELFINGER of about $8,000. The steamer EDWARD HINES collided with the steamer CENTURION, the damage to the former amounting to about $15,000.

The steamer ALEX MCDOUGALL met with a serious accident when she ran ashore in thick weather on Duck Island, Lake Huron, on Aug. 3, it being necessary to practically rebuild the entire bottom of the vessel. Disabled steering gear on the steamer HARVEY H. BROWN caused her to strike the west bank in the Livingstone channel on Sept. 9, damaging 39 plates.

Accidents to Lake Vessels in Second Half of 1915

Date.	Name of Vessel.	Nature of Accident.	Location.
July 1	Str. H. W. Smith.....	Ran aground in harbor; released by tugs.....	South Chicago.
July 3	Str. A. J. McKee.....	Ran aground; released and went to Collingwood for repairs....	Little Current, Ont.
July 4	Str. John Plankington.....	Ran ashore; released after lightering; not damaged.....	Stribbing's Point, Soo River.
July 5	Str. Harvey D. Goulder.....	Ran aground; released by tug.....	Livingstone Channel.
July 5	Str. Edward Buckley.....	Hit an obstruction and ran aground; leaked under boiler room; released on 6th and taken to Ecorse for dry docking.....	Off Colchester, Lake Erie.
July 5	Str. Kalkaska	Broke her shaft; towed to Houghton by Coast Guard crew.....	Portage Ship Canal.
July 7	Coast Gd. Cutter Tuscarora.	Grounded in heavy fog; released by tug and docked for examination.	Off North Pt., Lake Michigan
July 9	Str. Robert Fulton.....	Collided with barge W. L. Jenney; side crushed in; repaired at Toledo.	Entrance to Lorain harbor.
July 9	Bge. W. L. Jenney.....	Collided with steamer Robert Fulton; 14 stern plates damaged; towed to Lorain shipyard for repair.....	Entrance to Lorain harbor.
July 9	Str. Ogdensburg	Struck a dredge; slightly damaged below water line.....	Near Chicago, Lake Michigan
July 10	Str. Matoa	Blew out her steam chest just after leaving Livingstone channel; delayed at Detroit for several days making repairs. Vessel was enroute to coast in two sections.....	Detroit river.
July 11	Str. Haddington	Ran aground; docked at Kingston, 33 plates removed.....	St. Lawrence river, near Montreal.
July 12	Dredge A. Y. Gowen.....	Struck a pier of International bridge when her anchors fouled; traveled about three miles and sank in 23 feet of water; crew rescued	Gov't ship canal, Buffalo.
July 12	Str. Choctaw	Collided with steamer Wahcondah in thick fog; hit between No. 1 and 2 hatches and sank in 22 minutes in 200 feet of water; total loss. Crew rescued and taken aboard Wahcondah; value of vessel estimated at $85,000; insured for $80,000.	Off Presque Isle, Lake Huron
July 12	Str. Wahcondah	Collided with steamer Choctaw in heavy fog; bow badly damaged and forepeak filled with water; temporarily repaired at Windsor; docked at Kingston July 28.....	Off Presque Isle, Lake Huron
July 13	Tug. Willis W.....	Fire destroyed most of cabin and forward portion of tug.....	Cleveland.
July 13	Str. C. W. Jacob.....	Hit Pittsburgh Coal Co. dock and damaged her stem.....	Chicago.
July 17	Str. Glenfinnan	Docked at Duluth for repairs; 21 plates damaged.....	.....

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Accidents to Lake Vessels in Second Half of 1915

(Continued from page 60)

Date.	Name of Vessel.	Nature of Accident.	Location.
July 17	Str. Arizona	Stuck fast in mud in dense fog; released by tugs on July 18...	Entrance to Little Traverse Bay.
July 19	Str. J. B. Eads	Ran aground; released on July 20 after lightering	Below St. Clair canal cut.
July 21	Str. John Stanton	Struck bottom, blocking traffic; released next day, uninjured	Maumee river.
July 22	Str. L. C. Smith	Collided with steamer Peter White; fantail on starboard side damaged.	Lake Huron.
July 23	Str. Chas. O. Jenkins	Ran aground in fog; released by tug, uninjured	St. Mary's river.
July ..	Str. Martian	Ran aground near entrance to harbor; No. 1 starboard tank leaked; went to Collingwood for repairs	Key Harbor, Ont.
July 24	Str. Eastland	Capsized; nearly 1,000 lives lost; righted by Great Lakes Towing Co., Aug. 13, at a cost of $34,500; sold at public auction at Chicago to Illinois Naval Reserve; to be remodeled...	Chicago river.
July 27	Str. D. Z. Norton	Scraped bottom in river	Milwaukee.
July 28	Str. T. H. Wickwire Jr.	Struck, puncturing her bottom; docked at Buffalo on July 31...	Niagara river.
July 29	Tug Elsie Nell	Part of Huron street bridge fell on her, knocking off smokestack.	Milwaukee.
July ..	Str. J. H. Wade	Ran aground, damaging 20 plates; released July 28 and left for Manitowoc, where she was docked	Bailey's Pt., Lake Michigan.
July 28	Str. J. H. Prentice	Ran aground; released by steamer Scranton and a tug	Near North Pt., Lake Huron
July 31	Str. Noronic	Ran aground in blue clay; released Aug. 3 by combined pulling of two tugs and four steamers when water rose; had to lighter.	Belle Isle, Detroit river.
Aug. 2	Str. Manitou	Ran aground; released, uninjured	Near Wilson Beach, Lake Michigan.
Aug. 3	Str. Chas. H. Hebard	Collided with steamer J. H. Sheadle; neither vessel injured	Toledo.
Aug. 3	Str. Chippewa	Large hole stove in her side by heavy sea	Lake Ontario.
Aug. 3	Str. Garden City	Eight feet of her upper works washed away in storm	Lake Ontario.
Aug. 3	Str. City of South Haven	Damaged her rudder stock	Chicago.
Aug. 3	Str. Alex. McDougall	Ran ashore in thick weather; No. 1, 2, and 3 tanks filled with water; docked at Toledo. Practically whole new bottom put on, there being 146 plates to take off and many inside beams badly bent, which had to be replaced	Duck Island, Lake Huron.
Aug. 3	Str. City of Sheboygan	Steering gear disabled in storm; railing lost and part of deck load of coal	Lake Erie, near Conneaut.
Aug. 4	Str. Loftus Cuddy	Steering gear disabled, causing her to swing across channel, blocking traffic; released by tugs, uninjured	Livingstone channel.
Aug. 4	Str. Harvey D. Goulder	Ran on reef in heavy fog; released on Aug. 6; temporarily repaired in shelter of canal; docked at Superior Aug. 16; 21 plates taken off and 40 frames repaired	Near Portage Lake ship canal
Aug. ..	Str. Alexandria	Ran ashore in storm; total loss	Scarboro Bluffs, near Toronto
Aug. 6	Str. Matthew Andrews	Ran aground in fog; released on Aug 9 after lightering; forepeak leaked; docked at Toledo on 14th; repairs completed Aug. 20	Pipe Island, St. Mary's river.
Aug. ..	Str. Rapids Prince	Struck, doing some damage to her bottom	Long Soo Rapids, St. Lawrence river.
Aug. ..	Str. L. W. Robinson	Struck, damaging a number of plates and frames; docked at Ogdensburg.	Lake Ontario.
Aug. 7	Str. Thomas Barlum	Ran ashore, released, uninjured	Near Crisp Point.
Aug. ..	Str. Nottingham	Ran ashore; released after lightering	Near Point Aux Pins.
Aug. 10	Tug. Sandusky	Turned turtle; two lives lost; raised Aug. 24; only slightly damaged.	Entrance to Sandusky bay.
Aug. 11	Bge. Ontario	Boiler head blew off, killing one man	St. Clair river.
Aug. ..	Str. H. C. Frick	Docked at South Chicago Aug. 11 for damage sustained by striking at Calcite; five plates taken off; forepeak and No. 1 tank damaged; six days needed for repairs	Calcite, Mich.
Aug. 13	Str. M. T. Greene	Ran aground.	Kelly Island, Lake Erie.
Aug. 14	Str. Lakeland	Broke her crankshaft; repaired at Detroit	Lake Huron.
Aug. 16	Str. Pathfinder	Ran into light crib No. 23, tearing large hole in her starboard side; beached and temporarily repaired; docked at Ashtabula Aug. 19, remaining six days for repairs	West Neebish cut, Soo river.
Aug. ..	Str. Lehigh	Struck; temporarily repaired at Kingston; docked at Cleveland.	Lachine canal.
Aug. 18	Bge. Francomb	Collided with Tonawanda island bridge, bow striking center pier; slight damage to vessel and bridge	Buffalo.
Aug. 20	Str. Olcott	Lost bucket off her wheel; temporarily repaired by diver at Mackinaw.	Near Mackinac.
Aug. ..	Str. A. C. Dinkey	Ran aground in thick weather	Peche island, Detroit river.
Aug. 20	Str. Superior City	Struck in thick weather; barge Magna, which she towed, hit steamer after she went on, damaging steering gear and stern; docked at Lorain Aug. 24; 10 plates removed	Corsica Shoal, Lake Huron.
Aug. 20	Bge. Magna	Collided with steamer Superior City when she struck; bow damaged; repaired at Lorain	Corsica Shoal, Lake Huron.
Aug. 23	Str. Ball Bros.	Lost anchor inside of breakwater	Cleveland.
Aug. 24	Str. Onoko	Struck Tift farm bridge	Buffalo.
Aug. ..	Str. Shenango	Damaged her bow by hitting Carnegie coal dock No. 1 at head of lakes.	Near Duluth.
Aug. ..	Bge. Rob Roy	Ran ashore; crew taken to port by tug Home Rule; released on Aug. 29	Off Long Pt., Lake Erie.
Aug. ..	Str. Petoskey	Hit obstruction and twisted her rudder	Saugatuck, Lake Michigan.
Aug. ..	Str. A. E. Ames	Ran ashore; forepeak and No. 1 tank filled with water; docked at Port Arthur Sept. 9	Farrow's Pt., St. Lawrence river.
Aug. ..	Str. Flagg	Dropped a propeller blade	St. Clair flats canal.
Aug. 27	Str. James H. Hoyt	Broke her tail shaft; towed to Milwaukee by tug; repaired at South Chicago.	Lake Michigan.
Aug. 29	Str. R. W. England	Ran aground in heavy fog; released after lightering 500 tons of coal.	Near Grassy Isl., Detroit river.
Aug. 30	Tug. Alva B	Damaged by fire	Buffalo.
Sep. 2	Bge. Chattanooga	Ran aground; released, uninjured	St. Clair river, near Stag Isl.
Sep. 3	Str. F. T. Heffelfinger	Collided with steamer Allegheny in fog; port bow damaged above water line; repaired at Cleveland in three weeks' time; 20 plates damaged; repairs estimated at $8,000 and were completed Sept. 24	Detroit river.
Sep. 3	Str. Allegheny	Collided with steamer F. T. Heffelfinder in fog; stopped at Detroit for minor repairs; only slightly damaged	Detroit river.
Sep. 3	Str. Tourist	Ran aground; realeased by tug	Near Grassy Island, Detroit river.
Sep. 3	Str. Malton	Hit a pier; reported pretty badly damaged	Port Colborne, Ont.
Sep. 4	Bge. Genoa	Struck a pier and sank with decks just awash; loaded with 1,200 tons of coal	Maumee river, Toledo.
Sep. ..	Str. Steelton	Struck; docked at Ashtabula for bottom repairs, which were completed Sept. 11	Near Montreal.

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Accidents to Lake Vessels in Second Half of 1915

(Continued from page 61)

Date.	Name of Vessel.	Nature of Accident.	Location.
Sep. 5	Str. W. P. Snyder.....	Ran aground, upbound with coal; released on 7th after lightering 1,800 tons; not damaged.....	Sugar Isl., Soo river.
Sep. 6	Str. John Dunn Jr.....	Collided with steamer C. A. Black, damaging 12 plates on port side; repaired at Toledo.....	Near Parisian Island, Whitefish bay.
Sep. 6	Str. C. A. Black.....	Collided with steamer John Dunn Jr.; repaired at Lorain; 9 plates damaged.....	Near Parisian Island, Whitefish bay.
Sep. 9	Str. Harvey H. Brown.....	Steering gear disabled and she went on west bank; released by tug after lightering 300 tons; docked at Lorain Sept. 15; 39 bottom plates damaged and heavy internal damage; out of commission two weeks.....	Livingstone channel.
Sep. 9	Str. Lyman C. Smith.....	In trying to avoid steamer Brown (above mentioned), struck east bank, losing shoe and rudder; towed to Toledo, where she was docked; out of commission ten days.....	Livingstone channel.
Sep. 9	Str. Christopher	Ran aground in storm, released after lightering 300 tons ore...	Russell Isl., St. Clair river.
Sep. 9	Str. Senator	Struck in storm; released by dredge.....	Bar Point, Detroit river.
Sep. 10	Str. Thomas Adams	Steering gear disabled, stranding her across channel; towed to Soo by tugs, where she was repaired.....	West Neebish channel.
Sep. 12	Str. J. M. Jenks.....	Ran aground; released on 13th after lightering 30,000 bushels grain.....	Pipe Island, Soo river.
Sep. 14	Str. W. L. Brown.....	Blown ashore near pumping station in heavy wind; docked at Toledo Sept. 28 for bottom repairs.....	Soo.
Sep. 14	Bge. Connelly Bros.	Struck center pier below locks in heavy wind, damaging her bow; repaired at Soo.....	Soo.
Sep. 14	Str. Onoko	Foundered; cause unknown; loaded with 110,000 bushels wheat. Total loss.....	Lake Superior, 14 miles outside Duluth.
Sep. 14	Str. Athabasca	While leaving Canadian canal during southeast gale, was blown against steamer Crescent City, denting several plates and damaging hawse pipe.....	Soo.
Sep. 14	Str. Crescent City	Hit by steamer Athabasca; several plates dented.....	Soo.
Sep. 16	Str. Superior	Ran aground; released by tug.....	Middle Point, St. Clair river.
Sep. 18	Str. A. P. Wright.....	Hit by steamer Alex. McDougall, breaking flange and bilge water pipe. McDougall not damaged.....	Little Rapids Cut.
Sep. 21	Str. Collinge	Ran ashore on a bar; released.....	.....
Sep. 21	Str. Kensington	Ran aground, owing to low water; released after lightering 200 tons.....	St. Clair ship canal.
Sep. 21	Str. G. J. Grammer.....	Ran aground, owing to low water; released by tug.....	St. Clair ship canal.
Sep. 21	Str. Schoolcraft	Broke her wheel; towed from Alpena to Detroit by a steamer...	.....
Sep. 23	Str. Lackawanna	Ran ashore, laden with grain; abandoned by owners to underwriters as constructive total loss; released Sept. 29, temporarily repaired; docked at Manitowoc Oct. 6, remaining two weeks; 50 plates taken off, shoe and rudder repaired.....	Gull Isl. Reef, Lake Mich.
Sep. 24	Str. John Crerar	Ran ashore; arrived at Duluth on 27th and went to shipyard for repairs; 27 bottom plates removed and 30 frames repaired.	Entrance to Depot Harbor, Lake Michigan.
Sep. 24	Str. Western Star	Stranded in thick weather; crew and passengers taken off; abandoned by owners as constructive total loss; loaded with coal; insured for $200,000; Great Lakes Towing Co. given contract to raise vessel and deliver to an American port on its bid of $58,500 or 65 per cent of value of vessel, underwriter's option; wrecking company purchased coal cargo of 7,000 tons for $3,000.....	Robertson Rock, Georgian bay
Sep. 25	Sch. City of Sheboygan.....	Foundered; five lives lost.....	Lake Ontario.
Sep. 26	Tug F. W. Gillett.....	Sprang a leak and sank; to be salved.....	Off Two Harbors, Lake Superior.
Sep. ..	Str. Arabian	Beached near Niagara, enroute from Montreal to Lake Superior; released Aug. 29 and taken to Port Dalhousie. Docked at Buffalo Oct. 8.....	Lake Ontario.
Sep. ..	Str. Hemlock	Bottom plates damaged. Docked at Toledo.....	.....
Sep. 26	Sch. Geo. W. Westcott.....	Picked up in waterlogged condition; lost considerable of her deck load of lumber; towed to Milwaukee by Coast Guard cutter Tuscarora.....	Off Sleeping Bear Point, Lake Michigan.
Sep. 29	Str. D. A. Gordon.....	Punctured her No. 2 tank; docked at Ashtabula Sept. 29; 4 plates damaged; repairs completed Oct. 3.....	.....
Sep. 30	Str. W. F. White.....	The 150-ton boom of this self-unloading vessel gave way, falling into slip, but later was raised; steamer went to Lorain for repairs, leaving there Oct. 8.....	Buffalo.
Sep. 30	Str. John J. Barlum.....	Ran aground; released by tug Michigan.....	Lower end St. Clair canal.
Oct. 1	Str. George B. Leonard.....	Collided with schooner M. W. Page; starboard bow damaged....	St. Clair Flats canal.
Oct. 1	Sch. M. W. Page.....	Collided with steamer George B. Leonard; sank to bottom close to bank; to be raised; part of lumber cargo lightered and taken to N. Tonawanda.....	St. Clair Flats canal.
Oct. 4	Str. Selwyn Eddy	Ran aground in mud; released by tug, uninjured.....	Off Ashtabula, Lake Erie.
Oct. ..	Str. Rosemount	Struck obstruction and ran ashore; released Oct. 8 and docked at Kingston; stem badly twisted, 44 plates damaged and four propeller blades had to be replaced.....	Brophy Point, St. Lawrence river.
Oct. ..	Str. Frontenac	Cracked a plate by hitting dock; temporarily repaired and continued on her journey.....	Marquette, Mich.
Oct. 8	Str. J. B. Nielson.....	Ran ashore while seeking shelter in a storm; released Oct. 14 by wrecker Favorite and towed to Soo where she was picked up by steamer and towed to Lorain; repaired Oct. 21; forepeak and No. 1 tank punctured and large hole stove in bottom.....	Keweenaw Point, Lake Superior.
Oct. ..	Str. Peter Reiss	Hit a dock; docked at Ashtabula Oct. 8, remaining until Oct. 13; eight plates removed.....	Superior, Wis.
Oct. 8	Str. W. P. Palmer.....	Grounded owing to low water, swinging across and blocking channel, delaying 30 vessels until she was released.....	Grosse Point, Detroit river.
Oct. 8	Str. Wainwright	Struck owing to low water and damaged her shoe; docked at Ecorse Oct. 12 for new rudder; repairs completed Oct. 20....	Detroit river.
Oct. 10	Str. Jacobs	Struck middle pier while entering Poe lock, puncturing hole in her port side; temporarily repaired at Soo.....	Soo canal.
Oct. 10	Str. W. H. Donner.....	Grounded; released after lightering; reloaded lightered cargo and left Oct. 11.....	Grosse Point, Detroit river.
Oct. 11	Bge. Commodore	Waterlogged, and settled on bottom.....	Thunder Bay.

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Accidents to Lake Vessels in Second Half of 1915

(Continued from page 62)

Date.	Name of Vessel.	Nature of Accident.	Location.
Oct. 11	Str. Northern Wave	Line became tangled in her wheel, delaying her seven hours while diver released it.....	Duluth.
Oct. ..	Str. C. A. Congdon.....	Struck; leaked; repaired at Superior.....	Detroit river.
Oct. 13	Str. D. R. Hanna.....	Knocked off 37 feet of foremast by hitting Superior ave. high level bridge; new foremast put on at Detroit.....	Cleveland, O.
Oct. 18	Str. Meaford	Ran ashore in fog; released and docked at Port Arthur; damage extended over her entire bottom, 37 plates being taken off....	Gravel Island, near entrance to St. Mary's river.
Oct. 16	Str. Maude	Rammed by steamer Hilton in heavy fog and sank in 16 ft. of water.	Schlinkert's dock, St. Clair river.
Oct. 18	Str. Edward Hines	Collided with steamer Centurion; damage estimated at $15,000..	Off Port Sanilac, Lake Huron.
Oct. 18	Str. G. A. Richardson.....	Hit by Clark street bridge; rail considerably damaged.....	Chicago, Ill.
Oct. ..	Str. Byron Whitaker	Ran ashore; released after lightering 5,000 bushels grain; lost her wheel and towed to Prescott to unload; repaired at Ogdensburg.	Cardinal, St. Lawrence river.
Oct. 20	Str. Arrow	Ran aground in heavy fog; released by tugs.....	Off Middle Bass Isl., Lake Erie.
Oct. 21	Str. L. Edward Hines.....	Ran aground on rocky bottom; released; slightly damaged.....	Windmill Point, Lake Erie.
Oct. ..	Str. Empress of Midland....	Struck and damaged her port side; docked at Buffalo.....	Soo lock.
Oct. 22	Bge. Dunmore	Struck by barge Ungava; slightly damaged.....	Soulanges canal.
Oct. 23	Str. Turret Cape	Steering gear became disabled; towed to Soo by tug, where she was repaired.	Lake Superior, near Iroquois.
Oct. 23	Bge. Iron Cliff	Ran aground on shoal spot; released by tug after 12 hours' work.	St. Clair river, near Point Edward.
Oct. 23	Str. Normandie	Sudden stranding of barge Iron Cliff, which she towed, pulled out her tow post, disabling her steering gear.....	St. Clair river, near Point Edward.
Oct. 24	Str. Princeton	Ran aground, released, uninjured.....	Middle Ground, St. Clair river.
Oct. ..	Str. J. B. Ketcham.....	Lost her shoe; docked at Port Huron.....	.....
Oct. 25	Bge. Isabel Reed	Badly damaged by fire.....	Montreal, Que.
Oct. ..	Str. Harvester	Grounded; docked at South Chicago Oct. 26 for repairs.....	Buffalo.
Nov. 1	Bge. Jay Gould.....	Cabin damaged by fire.....	Magnolia St. dock, Toledo, O.
Nov. 2	Str. W. H. Wolf.....	Fire broke out in her boiler room just as she was leaving port; returned to dock and unloaded part of cargo, then proceeded.	Duluth.
Nov. 2	Str. Charles Hubbard	Ran aground in old cut; released herself, uninjured.....	St. Clair Flats canal.
Nov. ..	Str. E. L. Booth.....	Struck, damaging shoe and rudder; docked at South Chicago, Nov. 3.	Little Current, Ont.
Nov. ..	Str. H. S. Holden.....	Collided with steamer Sir Thomas Shaughnessy; port quarter damaged.	Corsica Shoal, Lake Huron.
Nov. ..	Str. Sir Thos. Shaughnessy..	Collided with steamer H. S. Holden; damaged on starboard side, abreast of No. 26 hatch.....	Corsica Shoal, Lake Huron.
Nov. ..	Str. C. O. Jenkins.....	Struck; docked at South Chicago for repairs to her shoe and rudder.	Indiana Harbor.
Nov. ..	Str. Manitou	Ran ashore.	Squaw Island, Georgian Bay.
Nov. 5	Str. W. D. Rees.....	Ran aground; released, uninjured.....	Key Harbor, Ont.
Nov. 6	Bge. M. S. Bacon.....	Struck by a freighter; filled and sank in 22 feet of water.....	Near Grassy Island, Detroit river.
Nov. ..	Str. Harvey D. Goulder....	Struck, upbound, and made temporary repairs at Two Harbors, clearing Nov. 6 for lower lakes; docked at Cleveland Nov. 11; 25 plates damaged; in dry dock about 12 days.....	Lake Huron.
Nov. ..	Str. Amazonas	Seams opened while out in storm; pumps kept her clear until she reached the Soo, where she was repaired.....	Lake Superior.
Nov. 7	Str. Northern Queen	Struck; released on 8th by two tugs, after lightering 600 tons..	Canadian channel, Detroit river.
Nov. ..	Str. Water Lily	Ran aground.	Near Cornwall, St. Lawrence river.
Nov. 9	Str. E. H. Gary.....	Considerably shaken up in storm and arrived at Soo leaking; tied up and was repaired.....	Lake Superior.
Nov. 11	Str. W. P. Snyder Jr.....	Ran aground when she picked up 70-foot cable in her wheel; released after lighterng; docked at Ecorse for examination, but was not damaged.....	Lake St. Clair.
Nov. 12	Str. E. N. Ohl.....	Stranded owing to low water, blocking channel; broke her shoe and bent rudder; released on 13th by two tugs and a lighter, which also assisted her to Ashtabula; docked there on 17th and repairs completed on 17th; new shoe and rudder put on and several plates repaired.....	St. Clair Flats canal.
Nov. 12	Str. Arcturus	Stranded, owing to low water; blocked channel; released.....	St. Clair Flats canal.
Nov. ..	Tug Frank C. Barnes.....	Foundered; crew of five lost; wreckage of pilot house found off shore near Oswego; Barnes was enroute from Port Dalhousie to Montreal.....	Lake Ontario.
Nov. 13	Str. Isaac L. Ellwood.....	Ran aground owing to low water.....	St. Clair Flats canal.
Nov. 13	Str. Cepheus		
Nov. 13	Str. Ball Bros.		
Nov. 13	Str. Anna C. Minch.....		
Nov. 13	Str. Wainwright		
Nov. 13	Str. George B. Leonard...		
Nov. 13	Str. Lynch		
Nov. 15	Str. M. A. Bradley.....	Ran aground owing to low water.....	Toledo.
Nov. 15	Str. Normania	Stranded on east bank of channel; released and towed to Cleveland and unloaded on 18th; docked at Lorain Nov. 19 for new rudder.	St. Clair Ship Canal.
Nov. 15	Str. Colonel	Stranded, blocking channel; lost her shoe and rudder.....	St. Clair Ship Canal.
Nov. ..	Str. Percival Roberts Jr....	Stranded in middle of channel; released after lightering; reloaded ore and proceeded.....	St. Clair Ship Canal.
Nov. ..	Str. P. D. Armour.....	Wrecked near Erie, abandoned by her owners.....	Lake Erie, near Erie, Pa.
Nov. 16	Str. A. P. Wright.....	Burned to water's edge; total loss; loss of vessel estimated at $25,000 and of cargo of wheat, $120,000; fire started in coal bunkers; engine and boiler savalged by Whitney Bros., Duluth; hulk taken out on Lake Superior and sunk.....	Portage Entry, Lake Superior.
Nov. 16	Str. Thomas Shaunghnessy..	Collided with steamer W. A. Paine; 12 plates damaged; arrived at Detroit with assistance of tugs on 18th; temporarily repaired and sailed on 23rd; later docked at Port Arthur.	Herson Island, St. Clair river.
Nov. 16	Str. W. A. Paine.....	Collided with steamer Thomas Shaughnessy; 20 plates damaged; repaired at Lorain; new stem put on.....	Herson Island, St. Clair river.
Nov. 16	Str. Wilpen	Ran aground; released, uninjured.....	Southeast Bend, St. Clair river.

(Concluded on page 64)

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Accidents to Lake Vessels in Second Half of 1915

(Concluded from page 63)

Date.	Name of Vessel.	Nature of Accident.	Location.
Nov. 18	Bge. Harold	Burned to water's edge while loading lumber; loss estimated at $15,000; towed to nearby island and scuttled; total loss	Nesterville, Ont.
Nov. 19	Str. Richard Trimble	Grounded, owing to low water; released on 23rd	Lake St. Clair.
Nov. 19	Str. Northern King	Forward cabins stove in while out in gale; temporarily repaired.	Lake Huron.
Nov. 19	Str. W. L. Brown	Ran on bottom when she went inside to retrim cargo, which had shifted while steamer was out in a gale on Lake Huron	Harbor Beach, Lake Huron.
Nov. 20	Str. John Lambert	Grounded in heavy gale; released by tugs	Near Tift farm, Buffalo.
Nov. 20	Str. Owana	Left stranded at her dock as high winds lowered water level	Toledo.
Nov. 20	Bge. Rob Roy	Sank; 6 feet of water over her; to be floated	Erie harbor.
Nov. 20	Str. Wm. Livingstone	Struck; docked at Toledo	Sandusky.
Nov. 21	Str. Theo. H. Wickwire Jr.	Ran aground.	St. Clair Ship Canal.
Nov. 21	Str. Follette	Hit by Fuller Ave. bridge, damaging after house and carrying away smoke stack	Chicago.
Nov. ..	Tug Cortland	Sank	Fairhaven harbor.
Nov. ..	Str. Inland	Struck; docked at Port Arthur	Angus Island.
Nov. 25	Str. Nyanza	Ran aground; released on Nov 29 after lightering 500 tons coal.	Near Erie, Lake Erie.
Nov. 29	Str. Caldera	Ran aground owing to low water, blocking channel and delaying 25 freighters	Grosse Pt., Detroit river.
Nov. 29	Str. R. L. Ireland	Ran aground; lightered; released; docked at Buffalo Dec. 29	Sweet's Point.
Nov. ..	Str. Kinmount	Struck.	Welland canal.
Nov. 30	Str. Vulcan	Ran aground owing to low water	Sandusky.
Dec. 1	Str. Corsica	Ran aground.	Maumee river.
Dec. 2	Str. City of Bangor	Ran ashore; No. 1 starboard tank punctured; leaked; released on 5th and went to Duluth, where she was docked	Menagerie Isl., Lake Superior.
Dec. 7	Str. Malton	Stranded; several plates sprung; went to Port Arthur	Keweenaw Point, Lake Superior.
Dec. 7	Str. F. B. Squire	Grounded on account of fog and low water; released on 8th when water rose.	Upper St. Mary's river.
Dec. 13	Str. W. S. Mack	Ran aground; released on 14th after lightering	West Neebish channel.
Dec. 15	Str. Majestic	Completely destroyed by fire; insured for $85,000	Sarnia, Ont.
Dec. 15	Str. Saronic	Forward cabin damaged by fire which spread from steamer Majestic; loss estimated at $5,000, covered by insurance	Sarnia, Ont.
Dec. 15	Str. Mariska	Struck bottom; leaked, lost her shoe and two plates damaged; released after lightering 25,000 bushels of grain; temporarily repaired by diver; heavy loss on wet grain cargo; arrived at Collingwood, Ont., Dec. 27 in tow of a tug	Harbor Beach, Lake Huron.
Dec. 15	Str. Fleetwood	Ran ashore; released herself on 16th; not damaged; snapped cable wires between island and mainland	Mouse Island reef, Lake Erie
Dec. 30	Str. Nyack	Burned at her dock and sank to bottom; insured for $50,000; total loss	Muskegon, Mich.

Sailing Ships Take the Seas Again

By H. H. Dunn

THE internment of German and Austrian merchant ships, and the diversion from regular channels of trade of countless British, French, Belgian, Russian, and other merchant steamers, owing to war emergencies, has worked a renaissance among sailing vessels. This is particularly to be noted on the gulf of Mexico. The great lumber exports of the south must find carriers, and the sailing ship has come to the rescue in noble fashion. On a recent trip from Tampa to New Orleans, 11 sailing craft were seen. Seven of these were full-rigged barques, bound outward from American gulf ports. Three were Swedes, four Hollanders, three were Danes, and one a Britisher. This is in striking contrast to a voyage from Vera Cruz to New York four years ago, during which but three sailing vessels were descried.

The extent to which the revival of sailing trade has aided the southern lumber business is indicated by the fact that in Louisiana alone, 25 hardwood mills are running full force, their output being handled entirely by windjammers.

One of the largest schooners ever seen on the gulf, and one of the largest flying the stars and stripes, has been loading 1,500,000 feet of lumber at Jacksonville, Fla. This is DOROTHY B. BARNETT, of Bath, Me., 210 feet long, 45 feet beam and 25 feet depth, of 2,088 gross tons. She is in charge of Captain William Merritt.

There has always been a heavy movement of export staves by sailing vessels from New Orleans, nearly all of which formerly went to Spanish or Portuguese ports in ships owned or chartered for this purpose by large stave export firms in the Crescent city. Now, however, great quantities of general lumber are being handled, and the increase in the lumber traffic under sail is a good barometer by which to gage the sailing-ship traffic in other commodities.

This summer a number of sailing vessels laden with staves cleared from New Orleans for various foreign ports. Notable among these was the wooden barkentine NAVEGANTE, the smallest ship of any kind ever to leave New Orleans with staves. NAVEGANTE is of only 279 tons net register, and was cleared by Bobet Bros., with 12,600 white oak staves, valued at $3,700, for Oporto. Almost immediately following NAVEGANTE, Ramoneda Bros. sent out 142,900 staves on the veteran barque, PEDRO DE'ALENQUER, also owned in Portugal. In contrast to her little predecessor, this big wind-jammer has a net register of 1,463 tons. Her cargo was worth $25,000 and went to Lisbon.

Shortly after this, Bobet Bros. cleared the Portuguese iron barque PORTO PARA, for Oporto, with 51,000 oak staves, 42,800 feet of oak and gum lumber, 200 bales of cotton, and a considerable shipment of sheet steel and wire. This shipment of cotton is rather important as, in conjunction with other shipments of the staple, it marks a wider entrance of sailing craft into the carrying of the south's chief product. Bobet Bros. also cleared the Portuguese barque, PORTUGAL, of 1,273 tons, net, with rough staves for Oporto. The American schooner ROSEFIELD, of 1,950 net tons, cleared with 80,000 rough staves for Cadiz and Barcelona.

Especial interest, however, attached to the bringing to New Orleans, through the combined efforts of the port commission and Alfred H. Clement, a freight-forwarding agent of the Crescent City, of the big barques STOREGUT, MOSVOS, CELTIC QUEEN, and GENERAL GORDON, to carry 8,000,000 feet of lumber.

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A Friend of Sailors on the Lakes

George Edward Nesbitt, Superintendent of Labor, Pittsburgh Steamship Co., Devotes All His Time to Giving the Boys a Square Deal

By Ralph D. Williams

NEXT to the immortal Rumsey, the subject of this sketch is undoubtedly the best known man on the lakes to the rank and file of the service. He has been concerned with the shipping of men since early manhood. George Edward Nesbitt, commonly called Ed, was born in the Georgian bay country, his parents having emigrated from the north of Ireland. His father was a school teacher but young Nesbitt's inclination was for the water and he worked aboard the fishing smacks around Manitoulin island before he was 14 years old. Nature gifted him with a stalwart, athletic figure and the open life which he led contributed greatly to his physical development. In fact, there were few men in the world more formidable, physically, than Ed Nesbitt at the age of 21. It was very natural, therefore, that athletics should attract him. His first entry into city life was as physical instructor of the Buffalo Athletic Club. He could not, however, remain long away from the water, and in 1889 he entered the offices of J. J. H. Brown, at that time Buffalo's leading vessel broker. It was in Brown's office that the idea occurred to Nesbitt that supplying men to vessels is a special trade in itself and in conjunction with W. H. Boyd he opened a shipping office in Buffalo. It was not long before his work attracted attention and he was offered the position of shipping commissioner for the Lake Carriers' Association of Buffalo. This Association is not to be confounded with the present Lake Carriers' Association. It was simply an association of the package freight lines operating out of Buffalo, which city has always been the headquarters for the package freight business of the lakes.

An association, known as the Vessel Owners' Association, existed in Cleveland, but it was composed wholly of bulk freighters and its influence, relatively, was small. In fact at that time the package freighters, with their railroad connections, were the prominent factors in lake traffic, the bulk freighters occupying a decidedly secondary position. Both associations, however, had much in common and were, in a measure, duplicating each other's work so that the advantage of consolidation annually became more manifest. Both were finally combined under the name of the Buffalo organization, Lake Carriers' Association, as possessing the broader title but it was some years before the bulk freight element came into the ascendancy. This was eventually achieved through the natural evolution of the trade, the growth of the bulk freight trade having been steady and of late years phenomenal.

It will thus be seen how very naturally George Edward Nesbitt passed into the employ of the greater Lake Carriers' Association. He continued to serve until 1906, when he accepted the position of labor commissioner for the Pittsburgh Steamship Co. His position with this company, which is the lake end of the United States Steel Corporation, is exactly what the title indicates. He is the representative of labor and his job is to see that everyone aboard ship gets a square deal. No better man could have been selected, for he brought to the position a large experience, broad sympathy and a complete understanding of the men. Nesbitt has probably ironed out more annoying little wrinkles aboard ship than any man in lake employ, and he is entitled to his share of credit for the smoothness with which his great organization is run. Every man aboard ship is a captain to Nesbitt and he never fails to salute the sailor wherever he sees him. It is astonishing what trifles can provoke dispute on board ship,

THE BOYS ALL CALL HIM ED

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but Nesbitt is past master in the art of settling them amicably. He makes it his business to see that no just cause for complaint goes unsatisfied. He is aboard every vessel at some time or other during the season and the men have learne to feel that he is their court of common pleas. Now it will sometimes happen that the steward will take mighty good care of the captain but will be a little careless with the rest of the crew. If the captain is not an observant man he may not notice this but it is very quickly noticed by the crew. While they might be diffident in pouring out their resentment to the master, they manifest no reluctance whatever in unburdening themselves to the labor commissioner. Nesbitt's job then is to straighten out this little tangle which he usually does in a very diplomatic way. The chances are that the captain hasn't noticed it at all but once he is tipped off he is not slow in remedying the trouble.

Nesbitt is all the time putting himself out on behalf of the men—that is to say he will give them what they want if it is at all possible to do so. As an example of this, two men who had paid their fare from St. Clair to Cleveland applied to him for jobs. He told them to report at Conneaut but they said that they had spent all their funds in transportation from St. Clair and wanted to be put aboard some boat in Cleveland. There was no boat in Cleveland but Nesbitt in their presence called up a hotel, frequented by sailors, and told the clerk to provide lodging for a couple of men he was sending down. He then told them to call in the morning and in their presence called up Lee of the Lake Shore to provide them with transportation to Conneaut and still in their presence called up Ford, the shipping commissioner at Conneaut, to put them aboard either COLE or MORGAN or some other vessel if men were needed. These two men left the office convinced that everything was done for them that could be done. These examples of Nesbitt's thoughtfulness could be multiplied indefinitely. He proves to the men that the company is doing a lot of thinking about them.

Ninety-eight per cent of the men aboard the vessels of the Pittsburgh Steamship Co. are enrolled in the welfare plan of the Lake Carriers' Association and a large proportion of them have bank accounts.

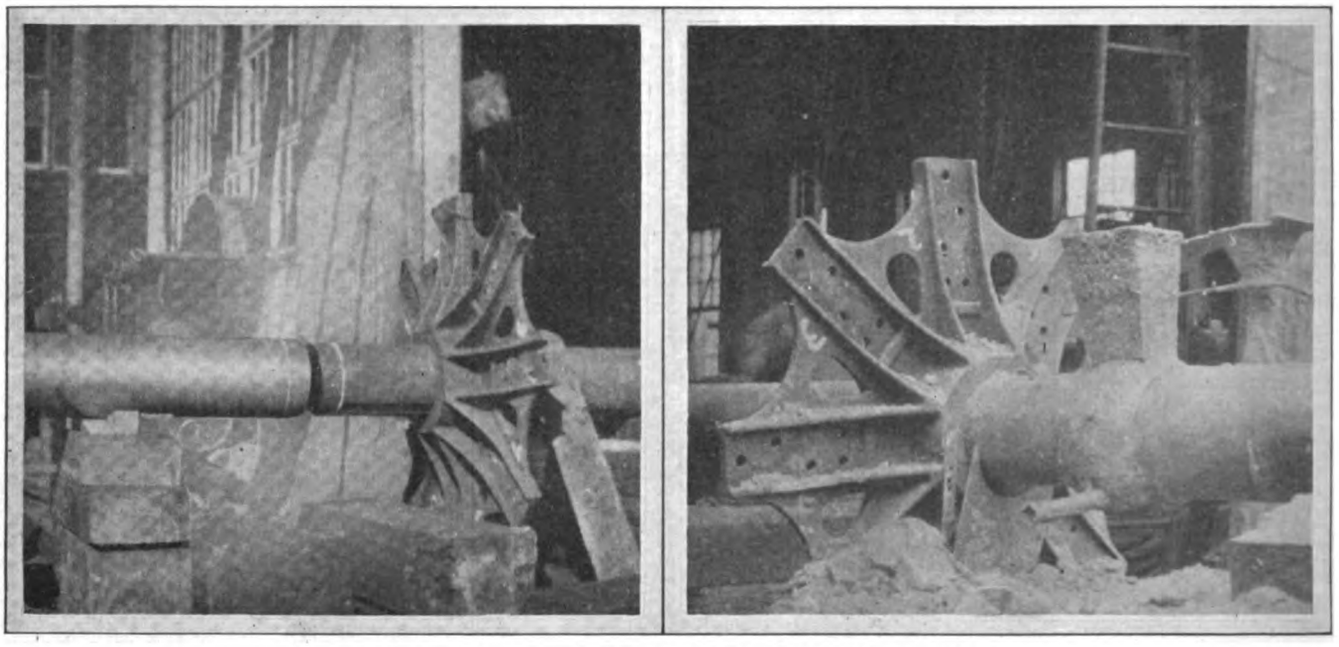
Nesbitt also handles the criminal work of the company and some of his achievements in this line would serve as a groundwork for a Conan Doyle story. He has done some exceedingly clever detective work, for in so large a fleet it is no wonder that an occasional rascal gets aboard ship and appropriates either money or property that does not belong to him.

A Stalwart Figure

Nesbitt is now 52 years of age. Physically there are few men of his years like him. He is as erect as a pine tree and though considerably above the average height he does not look it owing to his big proportions. He is thick-necked, deep-chested and broad, with enormous biceps and hard and sturdy legs. His hair is becoming gray but his face is youthful and his step quick and elastic. His perfect physical endowment at the age of 52 is the reward of an abstemious life and he will probably carry all his faculties unimpaired into a ripe old age.

Interesting Repair Job

A welding job of rather unusual magnitude was recently performed at Jacksonville, Fla., when the broken stern wheel shaft of the river steamer OSCEOLA was reunited by the use of thermit. The original shaft was 10 inches in diameter, the new piece of shaft welded on being 11 inches in diameter. OSCEOLA, which is owned by the Clyde Steamship Co., is a steel craft 180 feet long and 41 feet beam, with a molded depth of 8 feet. The vessel's stern wheel is driven by a 60-horsepower engine. The shaft broke within a short distance of one end. It was considered too difficult a task to maintain the shaft in perfect alignment during the welding process. The employment of a new piece 1 inch larger in diameter, however, permitted of turning the welded shaft down to the proper diameter and of correcting its alignment at the same time.



BEFORE AND AFTER WELDING STERN WHEEL SHAFT

A sheet iron mold box was constructed and special molding and facing material was mixed. Pattern wax was then applied to the parts which were to be welded. This proved of unusual difficulty, owing to the extreme heat of the sun, which tended to melt the wax. The welding material consisted of 500 pounds of a mixture of thermit, mild steel punchings, manganese and nickel-thermit, which produced 325 pounds of steel. About 24 hours after pouring, the mold was dismantled, the weld being found satisfactory. By means of an oxy-acetylene torch, the gates and riser were cut away. The shaft was then sent to the machine shop and turned down to 10 inches diameter and a true alignment.

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In the Traffic Manager's Office

A Review of the Charter Market on Coasts and Lakes—Pointers for the Men Who Get the Business

Shipping Conditions After the War

THE probable shortage of tonnage and general shipping conditions at the conclusion of the European war, are now the principal topics under consideration by American shipping interests. The view, freely expressed, that when the war is over there may be a great shortage of ships owing to the large quantity of raw material which will be required, has brought about widespread interest in suggestions as to what should be done by the United States government to meet post-bellum shipping problems, with special reference to that tonnage which has already been transferred from foreign to American registry, under the act of congress passed in August, 1914.

Mail advices and cable dispatches from Norway, Sweden, Holland and other neutral countries in Europe, which have been received recently by shipping men in this country, contain interesting points as to how those nations regard the after-war shipping problems. In Holland, the Nymwegen chamber of commerce, which represents an important commercial district of the Netherlands, has been in communication with the Dutch minister of commerce and agriculture with regard to the mercantile shipping of the country.

May Forbid Sale of Dutch Boats

The fear that the close of the war will witness an acute shortage of shipping facilities caused the Dutch commercial organization to make the suggestion to the government authorities that it might be necessary to prohibit the sale of Dutch merchant ships.

In reply, the Dutch minister of commerce stated that the Dutch mercantile fleet on Aug. 25, 1915, consisted of 318 boats, with a total tonnage of 1,148,000, as against 325 boats, with a total tonnage of 1,109,000 on Aug. 1, 1914. The change, it was explained, was due to 31 ships, with a total tonnage of 84,000, having been sold, sunk or captured in the first year of the war, while during the same period 24 new boats, with an aggregate tonnage of 123,000, have been built. In addition 38 ships, representing an aggregate tonnage of 122,000, are in course of construction for Dutch owners, and 30 more boats, representing 78,500 tons, have been ordered from the same interests.

On this basis the Dutch minister of commerce maintains that there is no danger of a shortage in the Dutch fleet. When peace is restored, he says, a large number of merchant ships will be set at liberty; for example, the entire German fleet, the boats now being held up in the Black Sea and about half the English fleet, say, a quarter of the world's tonnage, which is now engaged in service for the British government.

The Dutch minister of commerce is stated further to have responded that he did not deem it necessary to take steps to prohibit the sale of Dutch ships to foreigners, as one of the direct consequences of the destruction caused by the war, in his opinion, will be a large reduction in all goods not absolutely necessary, so that the demand on shipping facilities for some time after the war will not be large.

Similar movements to prohibit the sale of Norwegian and Swedish mercantile tonnage to foreigners also are said to be under consideration. In neither of the two countries mentioned, however, is it claimed that the step is looked on with favor by a majority of the shipping men or the respective government officials.

Interesting figures bearing on the ship shortage possibilities of the near and distant future, from the standpoint of available British mercantile tonnage, were given in a parliamentary debate recently. Out of 3,767 vessels owned by Great Britain of more than 1,000 tons net, it was stated, the government has taken up something between 1,500 and 1,800, in some cases practically whole lines of steamers being requisitioned, and within the past month no less than 500,000 tons of cargo space have been so requisitioned.

* * *

INTERESTING data on the percentages of tonnage belonging to several of the largest British shipping concerns under requisition on Nov. 1, 1915, compared with the percentages of the same under requisition on Jan. 1, 1915, have been received by *The Marine Review*. The information was given during a debate in parliament, in response to a question put by a member as to the percentages of the tonnage of nine British shipping concerns which had been called into the service of the government. The particulars given are as follows:

	Up to Jan. 1, 1915.	On Nov. 1, 1915.
	—Per cent.—	
British India Steam Navigation Co., Ltd.	46.5	41.3
Canadian Pacific Railway Co.	16.0	20.0
T. Wilson, Sons & Co., Ltd.	9.0	13.75
Raeburn & Verel, Ltd.	....	25.0
Maclay & McIntyre	2.1	24.5
E. T. Radcliffe & Co.	4.3	36.0
Foster, Hain & Reed (E. Hain & Son)	36.4	25.7
W. Runciman & Co.	1.6	22.6
Prince Line, Ltd.	10.15	18.0

The figures given for the period from the commencement of the war up to Jan. 1, 1915, represent the proportion which the total time for which the ships requisitioned were on government service, bears to the full working time of the whole fleet for the period Aug. 4, 1914, to Jan. 1, 1915. The details given for Nov. 1, 1915, show the percentage of ships belonging to the respective firms which were actually on service at that date.

Figures Are Incomplete

No information is given in the above concerning the requisitioned number or percentages of the vessels under charter to or owned by Messrs. Furness, Withy & Co., one of the largest of the British shipping companies. From other sources, however, the fact is secured that at the present time, the British admiralty has placed under requisition approximately 48 per cent of the total tonnage of that company, or something over 50 vessels.

An amusing incident in connection with the requisitioning activities of the British admiralty concerns the experience of the Nelson Line, which for many years has operated a large fleet of refrigerator steamers between the River Plate and United Kingdom ports. It is asserted that while the admiralty has com-

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mandered practically all of the refrigerator ship tonnage operating between South American ports and Great Britain, no requisition order affecting the ships of the Nelson Line has yet been issued.

The story goes that the average compensation paid to the owners of requitioned tonnage by the British government is about one-half of the prevailing market quotations. As a measure of economy therefore every British meat carrying steamer plying between the River Plate and the United Kingdom has been placed under requisition, with the single exception of the Nelson Line boats. This is said to be due to the fact that that company entered into a long term contract with River Plate shippers to transport their shipments to the United Kingdom ports, at a rate which is about one-fourth of the prevailing market rate for such service at the present time.

If the British government requisitioned the vessels of the Nelson Line, the company would automatically have its contract rate for carrying the meat products doubled. Inasmuch as the line is obligated by contract to carry the meat at a rate lower than the so-called "requisition rate" would net, the British admiralty has not interfered with the operations of the line, although shipping men abroad say efforts have been made to have the steamers requisitioned.

* * *

COPIES of the British, German and Austrian laws in regard to the transfer to foreigners of their national ships have been received recently. The information conveyed is especially valuable at the present time, when efforts are being made to extend American ownership of ships engaged in international traffic.

British Ship Transfer Law

A bill to restrict the transfer of British ships to persons not qualified to own British ships makes the provisions:

1—A transfer made after Feb. 12, 1915, of a British ship registered in the United Kingdom, or a share therein, to a person not qualified to own a British ship, shall not have any effect unless the transfer is approved by the board of trade on behalf of His Majesty, and any person who makes, or purports to make, such a transfer after the commencement of this act, without that approval, shall, in respect of each offense, be guilty of a misdemeanor.

2—This act shall apply to British ships registered at foreign ports of registry, and to British ships registered in any British possession other than those mentioned in the schedule to this act, and it applies to British ships registered in the United Kingdom.

3—This act shall have effect only during the continuance of the present war.

The scheduled countries are British India, Canada, the Commonwealth of Australia (including Papua and Norfolk Island), New Zealand, South Africa and Newfoundland.

The German law of Oct. 21, 1915, forbids the transference, in whole or part, of the ownership in merchant vessels that are already built or in the course of construction, to persons who are not German subjects. Contravention, or such attempt, will be punished severely, also when committed by Germans abroad.

The *Handels-Museum*, the official publication of the Austrian museum of commerce, announced in its issue of Sept. 9 a decree of the ministry of commerce, dated Aug. 27, with reference to the sale of merchant vessels to foreign countries. The provisions of this decree are:

1—All legal business by which the ownership of Austrian merchant vessels shall be wholly or partly transferred to subjects of foreign governments requires special consent of the ministry of commerce. Such legal transactions closed without said consent are prohibited and invalid.

2—Transgressions of this decree, in so far as not subject to criminal punishment, will incur a fine of up to 5,000 crowns or imprisonment for six months.

3—This decree enters into force on the day of publication.

* * *

THE chamber of commerce of the United States states that, "The principal trouble with the American merchant marine is not that it is infinitesimally small. It is quite respectable, both in number and tonnage. Its lamentable weakness lies in the fact that it is out of all proportion to the enormous trade of the country.

"Out of a total of 26,701 registered and licensed vessels, less than 3,000 ever plow foreign seas. In foreign trade, our merchant marine consists of 37 steel sailing ships averaging 1,600 tons each, 544 wooden sailing vessels averaging 600 tons, 239 wooden steamers averaging 300 tons, and 331 steel steamships averaging 3,800 tons. There are also 537 motor boats and 1,106 barges.

"In large merchant steamers, the class that is fast growing in commerce and which is of a size and speed to render some assistance as naval auxiliaries, the United States stands third, surpassed only by Great Britain and Germany. But 60 per cent of the big and able steamers in the world are owned by Great Britain and less than 7 per cent by the United States.

"The trade of the United States has at its disposal only about one-tenth of the shipping facilities available to the British merchant and manufacturer. If the United States is to take its proper place it must not be content with mere rank."

Lumberman Discusses Merchant Marine

Evidence is multiplying that men of affairs in all walks of life are becoming awakened to the seriousness of our merchant marine situation. One of the most interesting discussions of this subject by a man not directly identified with shipping interests is found in the recent annual address delivered at San Francisco by J. J. Donovan, president of the Pacific Logging Congress. Mr. Donovan said in part:

"Because we have few suitable ships for the foreign trade on the Pacific many logging camps are closed and many mills are silent. The foreign ships on which we depended find the food and munition trade with the warring nations so remunerative that there is little space or thought of lumber, except for military purposes. Legitimate trade languishes because the one conspicuous failure in our economic progress is the development of our merchant marine.

Do Not Be Deceived

"Let no grandiloquent boasting of dreamer or demagogue deceive you. Our flag is gone from the Pacific. It will go from the Atlantic as soon as the great war ends, unless we radically change our laws along lines which will enable us to compete with the fleets of maritime nations. We may build up a lake and coastwise marine, no matter how onerous the legal handicap, by the simple expedient of shutting out all foreign ships. That we have done, but on the world's highway we have trimmed our sails to every political breeze and our ships are water-logged."

New Ship in Service

The new American steamship MUNAMAR, built by the Maryland Steel Co., Sparrow's Point, Md., for the Munson Steamship Line, has been placed in commission and is now in active service between New York and the eastern coast of Cuba. MUNAMAR is 367 feet 9 inches in length with a beam of 47 feet 3 inches, and is provided with bilge keels. The interior finish of the ship is said to be of an exceptionally elaborate and artistic character. The Antilla, Nite Bay and Nuevitas region of eastern Cuba, which MUNAMAR will serve, is a district of comparatively recently development. Land which a few years ago was virgin jungle is now raising large crops of sugar and fruit, a great deal of American capital being invested in this region.

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Traffic on Great Lakes in 1915

Complete Statistics Are Presented Showing Details of the Great Tonnage Moved Last Year—1916 Prospects Bright

VESSEL interests on the Great Lakes expect the first real test of the freight carrying capacity of their great fleets, to come this year. The iron and steel plants which consume iron ore from the Minnesota, Michigan and Wisconsin deposits, are assured of capacity operations for the year and the record iron ore movement of more than 49,000,000 tons, set in 1913, is practically certain to be surpassed. With every indication of a continuance of the heavy grain movement, the prospects for a busy season on the lakes in 1916, are unusually promising.

In the accompanying tables, the completed figures showing the traffic on the lakes in 1915, are presented. The great tonnage moved last year was generally below records set in earlier years, but the season, as a whole, was satisfactory. The freight carried during the closing months of navigation was unusually heavy and brought into active service practically every available freight carrier.

The table showing the commerce through the Soo canals reveals the fact that 21,233 vessels of 56,399,147 tons net tons register, passed through these waterways in 1915. The American canal locked through 16,910 vessels of 47,918,947 net tons register, and 4,323 vessels of 8,480,300 net tons, passed through the Canadian canal. Of the total volume of freight, 63,548,993 tons passed through the Canadian canal, a total of 71,290,304 net tons. The favorable showing of the American canal resulted from the continuous operation through the year of the new Davis lock.

The total coal movement was 26,220,000 net tons, of which soft coal represents 22,420,000 net tons and hard coal 3,800,000 net tons. The volume compares favorably with previous years, excepting 1913, when the movement exceeded 33,000,000 tons. The total grain movement was 386,019,375 bushels, or 11,194,562 net tons. This figure has been surpassed only by the movement during 1913.

The iron ore traffic shows shipments of 46,318,804 gross tons from upper lake ports, the third largest movement in the country's history. Of this tonnage, Lake Erie ports received 37,967,460 gross tons, and Lake Michigan ports 7,572,471 gross tons. Shipments to Canadian ports largely account for the remainder. The iron ore balance on Lake Erie docks on Dec. 1, according to figures compiled by *The Marine Review*, is well below the average of the past few years and by May 1, the docks are certain to be in better shape than in years. Shipments of iron ore to furnaces from May 1 to Dec. 1 were 35,149,412 gross tons.

The table showing the average time spent in port by vessels of the Pittsburgh Steamship Co. reveals the rapid progress made in recent years in loading and unloading facilities. Comparing 1906 and 1915, the average stay in lower lake ports has been reduced from 36 hours 15 minutes to 17 hours 41 minutes. At upper lake ports, the time has been cut from 22 hours 25 minutes to 7 hours 46 minutes, respectively. A comparison of the dispatch at Great Lakes ports in 1913 and 1915 indicates the great progress made in the past two years. The time saved at lower lake ports last year, over 1913, was 3 hours 28 minutes and at upper lake ports, 6 hours and 6 minutes, a total saving of 9 hours 34 minutes.

The table showing the average of the daily freight rates during 1915, indicates the gen-

Great Lakes Traffic Statistics

COMMERCE THROUGH SOO CANAL

	Total traffic for, 1914	1915	Increase or Decrease, Amount	Per Cent Inc.	Dec.
Vessels:					
Steamers, number	14,994	17,699	2,705	18	..
Sailing, number	1,682	1,884	202	12	..
Unregistered, number	2,041	1,650	391	..	19
Total, number	18,717	21,233	2,516	13	..
Lockages, number	13,502	13,808	306	2	..
Tonnage:					
Registered, net	41,986,339	56,399,147	14,412,808	34	..
Freight, short	55,369,934	71,290,304	15,920,370	29	..
Passengers, number	59,801	50,336	9,465	..	16
Coal, hard, short tons	2,240,505	2,030,730	209,775	..	9
Coal, soft, short tons	12,246,716	11,326,328	920,388	..	8
Flour, barrels	9,715,085	8,436,937	1,278,148	..	13
Wheat, bushels	150,284,095	255,481,558	105,197,463	70	..
Grain, bushels	68,338,072	64,786,870	3,551,202	..	5
Mfd. and pig iron, short tons	239,683	211,781	27,902	..	12
Salt, barrels	777,208	699,337	77,871	..	10
Copper, short tons	91,764	156,436	64,672	70	..
Iron ore, short tons	31,413,765	45,213,604	13,799,839	44	..
Lumber, M. ft. B. M.	452,138	456,451	4,303	1	..
General Mdse., short tons	1,317,304	1,595,398	278,094	21	..

COAL MOVEMENT ON LAKES, NET TONS

Year	Soft Coal: Pittsburgh	Ohio	Virginia	Total*	Hard Coal	Total Coal Movement
1915	10,100,000	2,620,000	8,750,000	22,420,000	3,800,000	26,220,000
1914	11,195,000	1,363,000	9,106,000	22,995,000	4,285,228	27,280,228
1913	13,415,473	6,176,624	8,736,586	28,328,683	5,033,696	33,362,379
1912	11,300,000	4,676,000	7,360,000	23,335,000	4,204,741	27,539,741
1911	10,611,941	4,019,544	7,151,200	21,782,685	3,917,419	25,700,104
1910	11,911,900	4,297,300	6,629,500	22,838,700	3,639,368	26,478,068
1909	8,687,395	3,002,815	3,874,570	15,564,690	3,052,706	18,617,396
1908	8,700,000	3,600,000	3,450,000	15,750,000	3,538,098	19,288,098
1907	10,549,995	4,074,296	3,420,941	18,037,232	3,449,695	21,486,927
1906	9,237,272	2,560,906	2,743,732	14,591,910	2,681,808	17,273,718
1905	7,443,883	2,062,692	2,109,262	11,615,837	2,785,362	14,401,199

*Includes fuel coal and also shipments from the Kentucky district and Pennsylvania districts other than Pittsburg.

GRAIN TRADE OF THE GREAT LAKES.

(Shipments of flour not included.)

	1915.	1914.	1913.	1912.	1911.
Lake Superior	320,236,805	218,622,167	317,051,875	243,110,902	137,924,520
Chicago	44,438,000	89,791,000	55,180,000	47,608,600	73,323,100
Milwaukee	4,324,428	10,857,683	11,867,798	16,655,248	20,198,171
Other ports	17,020,142	18,430,099	19,250,672	15,806,389	8,535,765
Total, bushels	386,019,375	337,718,949	403,360,346	323,181,139	239,981,556
Totals in net tons	11,194,562	9,793,850	11,697,160	9,372,252	6,959,465

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Iron Ore Traffic on Great Lakes in 1915

IRON ORE SHIPMENTS FROM UPPER LAKE PORTS, GROSS TONS.

	1915.	1914.	1913.	1912.	1911.	1910.
Escanaba	5,649,289	3,664,451	5,399,444	5,234,655	4,278,445	4,959,726
Marquette	3,099,589	1,755,726	3,137,617	3,296,761	2,200,380	3,248,516
Ashland	5,146,772	3,363,419	4,338,230	4,797,101	2,429,290	4,094,374
Superior	8,342,793	11,309,748	13,788,343	14,240,714	9,920,490	8,414,799
Duluth	15,437,419	6,318,291	12,331,126	10,495,577	6,934,269	13,640,166
Two Harbors	8,642,942	5,610,262	10,075,718	9,370,969	6,367,537	8,271,177
Total	46,318,804	32,021,897	49,070,478	47,435,777	32,130,411	42,628,758

IRON ORE RECEIPTS AT LAKE ERIE PORTS, GROSS TONS.

	1915.	1914.	1913.	1912.	1911.	1910.
Detroit	459,877	332,564	363,001	418,057	243,292	296,412
Toledo	1,158,374	773,711	1,084,215	1,411,278	493,345	1,225,202
Sandusky	.....	.....	.....	.....	.....	.....
Huron	695,865	617,363	687,485	540,586	223,947	197,951
Lorain	3,517,258	1,677,988	3,709,213	3,771,350	2,937,605	2,884,738
Cleveland	7,504,697	5,519,698	8,812,583	7,914,836	4,584,211	6,344,943
Fairport	2,001,103	1,558,134	2,037,126	1,801,381	666,365	1,516,434
Ashtabula	7,813,101	5,318,788	8,336,126	8,158,080	6,359,131	9,620,638
Conneaut	8,573,509	6,263,480	7,849,303	7,839,831	6,931,278	6,309,548
Erie	707,875	260,991	713,904	547,067	289,400	942,592
Buffalo	5,339,724	2,913,273	5,506,691	5,060,642	2,802,976	4,704,439
Port Colborne	196,077	166,665	.....	.....	.....	.....
Total	37,967,460	25,402,655	39,099,647	37,472,108	25,531,550	34,042,897

IRON ORE RECEIPTS AT LAKE MICHIGAN PORTS, GROSS TONS.

	1915.	1914.	1913.	1912.	1911.	1910.
South Chicago, Ill.	4,195,976	3,606,587	5,572,866	5,480,105	3,685,100	5,080,679
East Jordan, Mich.	37,658	38,158	28,444	42,878	36,232	37,910
Boyne City, Mich.	40.401	50,098	45,028	45,000	33,000	50,355
Elk Rapids, Mich.	.....	28,437	.....	47,947	26,814	60,857
Milwaukee	187,286	93,121	234,591	138,065	109,255	121,446
Indiana Harbor, Ind.	689,226	661,054	455,252	514,748	365,312	287,172
Gary, Ind.	2,421,924	1,631,564	2,365,551	2,088,327	1,302,745	1,775,880
Fruitport, Mich.	.....	.....	.....	.....	.....	37,785
Total	7,572,471	6,109,019	8,701,732	8,357,070	5,558,458	7,452,084

IRON ORE ON LAKE ERIE DOCKS DEC. 1, GROSS TONS.

	1915.	1914.	1913.	1912.	1911.	1910.
Toledo	311,799	580,600	349,047	552,016	661,382	433,215
Sandusky	1,871	2,471	2,472	2,472	2,471	17,728
Huron	558,692	483,769	441,541	385,810	344,371	375,118
Lorain	824,988	548,097	694,704	904,343	652,526	630,547
Cleveland	1,795,962	1,757,543	1,930,720	1,888,560	1,589,491	1,638,795
Fairport	413,994	406.124	478,014	565,920	636,566	839,970
Ashtabula	2,870,204	2,749,315	3,202,807	3,350,553	3,295,862	3,287,816
Conneaut	1,216,686	1,160,639	1,248,032	1,429,533	1,237,573	1,329,997
Erie	589,355	484,467	594,613	661,330	636.274	792,011
Buffalo	326,800	234,880	319,726	340,261	413,353	452,783
Total	8,910,351	8,407,905	9,261,676	10,080,798	9,469,869	9,797,980

Average Stay in Port

VESSELS OF PITTSBURGH STEAMSHIP CO.

	1915	1914	1913	1912	1911	1906
	hrs. min.	hrs. min.	hrs. min.	hrs. min.	hrs. min.	hrs. min.
Aver. stay lower lake ports	17 41	17 18	21 9	20 9	17 29	36 15
Aver. stay upper lake ports	7 46	9 12	13 52	11 51	10 50	22 25
Aver. time in port receiving and discharging cargoes	25 27	26 30	35 11	32 0	28 19	58 38
	Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Aver. cargo carried	7,534	7,572	7,283	6,796	6,306	5,954
Largest cargo carried	12,087	12,222	12,373	13,007	11,159	13,333
Fastest loading record	8,179 in 1 hr.	10,613 in 1 hr. 30 min.	5,897 in 75 min.	10,325 in 2 hr. 35 min.	9,362 in 25 min.	9,277 in 70 min.
Rate of fastest loading record per hour	8,179	7,075	4,718	4,136	22,469	7,288

Buffalo Grain Receipts

	1915.	1914.
Flour, bbls.	8,429,126	9,100,752
Wheat, bu.	166,670,198	100,442,591
Corn, bu.	17,281,413	14,309,078
Oats, bu.	10,969,616	11,858,666
Barley, bu.	13,512,782	13,229,162
Rye, bu.	3,787,863	4,268,738
Total, bu.	212,221,872	144,108,235
Fl. to wheat, bu.	42,145,630	45,503,760
Flaxseed, bu.	4,036,581	10,127,146
Grand total, bu.	258,404,083	199,739,141

Average Ore Cargo

Year	Gross Tons	Year	Gross Tons
1915	6.841	1905	6,101
1914	6.523	1904	5,272
1913	6,411	1903	5,668
1912	6,244	1902	4,899
1911	5,716	1901	4,459
1910	5,593	1900	3,783
1909	7,777	1899	3,803
1908	8,325	1898	3,517
1907	7,516	1897	3,556
1906	6,973	1896	2,202

D. M. & N. docks only up to 1910. All docks 1910-1915.

erally lower rates prevailing, with the exception of grain. The high rates paid during the closing months of the season sent the average grain rate to a new record.

The steamer W. GRANT MORDEN broke both the wheat and oats carrying records on the Great Lakes in 1915. On Oct. 18, MORDEN carried 476,315 bushels of wheat from Port Arthur to Tiffin and McNicoll. The previous wheat record had been held by WILLIAM P. SNYDER JR., which carried 460,000 bushels from Duluth on July 10, 1913. MORDEN also carried 760,066 bushels of oats from Port Arthur to McNicoll on Dec. 9. The previous record was held by MATTHEW ANDREWS, which carried 605.898 bushels of oats to Port Colborne in 1914. MORDEN'S largest cargo of ore during the season was 12,136 gross tons, carried from Escanaba to Point Edward. The record for a single cargo of ore is still held by H. H. ROGERS, which carried 13,333 gross tons from Escanaba to South Chicago. The coal-carrying record still rests with WILLIAM P. SNYDER, which carried 13,847 net tons of coal from Lorain on Aug. 2, 1913, but SCHOONMAKER nearly equaled it this year by carrying 13,559 net tons from Ashtabula to Superior.

Furnace Shipments

ORE FORWARDED TO FURNACES FROM LAKE ERIE DOCKS, MAY 1-DEC. 1.

Year.	Gross Tons.	Year.	Gross Tons.
1915	35,149,412	1912	33,421,251
1914	22,914,887	1911	23,011,274
1913	35,747,800	1910	29,724,938

The Welland canal was opened for traffic on April 15 and closed Dec. 15. The first vessel which passed through the canal was the steamer W. H. DWYER, upbound, on April 16, and the last was the steamer CADILLAC, downbound, on Dec. 13. The total number of passages through the canal was 2,782, of which 1,394 were upbound vessels and 1,388 downbound. The total volume of traffic moved was 3,061,012 tons, the vessel tonnage aggregating 2,855,195 tons. The largest upbound cargo was carried by the steamer A. M. MARSHALL, consisting of 2,343 tons of coal, while the largest downbound cargo carried was 2,800 tons of soft coal by TOILER.

Ore Unloading Records

The ore and coal-loading and unloading records on the Great Lakes were not broken in 1915. The best record of the Pittsburgh & Conneaut Dock Co., at Conneaut, O., was made on May 22, when 10,693 tons, railroad weight, of ore was unloaded in four

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hours at No. 4 dock. This record is well below that of WIDENER in 1912, 10,636 tons being unloaded in two hours and 50 minutes. The best unloading record made at the Ashtabula & Buffalo Dock Co.'s dock at Ashtabula Harbor was on June 22, when 11,046 tons of ore were taken out of RICHARD TRIMBLE in three hours and 42 minutes actual working time, an average of 746.35 tons per machine per hour. This is an excellent record for time per machine per hour. On coal loading, the Conneaut dock loaded PERCIVAL ROBERTS JR. with 315 cars of coal in seven hours.

Builds Life Boat

The C. M. Lane Life Boat Co., Brooklyn, N. Y., is busily engaged in turning out wooden and metallic life boats. More than 40 boat builders are employed. This company builds a collapsible life boat, which has been approved and classified as a 2C pontoon life boat by the government. The Lane company also is building these boats at Sorel, Canada.

The newly organized Java-Pacific line has just announced its complete service to be given by four Dutch steamers, with monthly sailings out of San Francisco. The vessels will first touch at Hong Kong on their outward trpis, then at Manila, Batavia, Cheribon, Pecalonga, Tagal, Samarang, Soerbaya and Mkassar. The steamer ARAKAN leaves San Francisco about Feb. 22; TJISONDARI, March 23; KARIMOEN, April 22, and TJIKEMBANG, May 22. As previously announced, J. D. Spreckels & Bros. Co. will be the general agent of the new line at San Francisco and Fred Conner, traffic manager.

After lying submerged for 14 months in Alaskan waters, subsequently salved, and since tied up for more than 12 months, the steamer CURACAO has been purchased by the Pacific Coast Steamship Co., which concern owned the vessel at the time she was wrecked at Warm Chuck, Alaska. The steamer is to re-enter the company's Alaskan trade next spring.

It is reported that a big ship building plant capable of turning out steel as well as wooden vessels may soon be built at St. Helens, on the lower Columbia river. Officers of the St. Helens Shipbuilding Co. have been asked to consider plans for enlargement of its plant that will permit the laying of steel hulls with a maximum length of about 350 feet.

Italy Grabs Steamers

By Harry H. Dunn

At the beginning of the new year, the Italian government commandeered some 20 steamers belonging to two Italian steamer lines which operate between New Orleans and ports on the Mediterranean coasts of Italy. Six ships were taken from the Pearce-Cottoneira line, according to dispatches received by Ross & Heyn, its agents in the Crescent City, and 14 from the Creole line, according to W. H. Hendren, New Orleans manager for the Texas Transport & Terminal Co., agent for the Creole company. The steamers are to be impressed into transport service for the Italian army. Both lines have maintained regular sailings out of New Orleans and other gulf ports for several years. Rates to Mediterranean ports from New Orleans already are excessively high, and agents of both lines here intimate that they will be lifted still higher by this seizure. Thousands of bales of cotton had been booked in advance for Italy via these lines, and much difficulty probably will be had in finding bottoms to carry this large and valuable trade. The principal ports served are Genoa and Naples, with a smaller traffic with Palermo and other ports. Marseilles is also touched and rates to the French port via these lines probably also will be affected.

Another Ship Yard in East

To help build up the American merchant marine on the Atlantic seaboard, and to take advantage of the opportunities that will come for the American flag on the seas when the war is over—these, according to Wallace Downey, ship builder, are the reasons for the founding of the Standard Shipbuilding Corporation, a $3,000,000 company recently organized to do business on Staten Island. The new company has taken over the 30-acre plant of the Townsend & Downey ship yards at Mariner's Harbor, and work will soon be begun to double its capacity. It is announced that contracts for the next several years have been underwritten and that a definite plan for ship building has been decided upon.

"Secretary McAdoo and others who are proposing government ownership of ships and a government-operated merchant marine, are trying to impress the public with the alleged fact that American capital is not going into American maritime industries," said Mr. Downey. "That assumption is absolutely false, as is evidenced by the fact that American capital is entering into the ship building industry as represented by the Standard Shipbuilding Corporation, and more emphatically evidenced by the fact that the entire tonnage output of its yard has already been underwritten entirely by American capital.

"Capital is ready and willing to enter the American maritime industry, as is shown not only by the formation of this company, but also by the fact that all other Atlantic and Pacific coast ship yards are filled with orders that will keep them going to capacity for the next two or three years. Practically all this activity represents American capital investments in American maritime industries."

Average Daily Freight Rates on Great Lakes

	Cents. 1915	Cents. 1914	Cents. 1913	Cents. 1912	Cents. 1911	Cents. 1910
Iron ore, Escanaba to Ohio ports, gross ton	25	35	40	38.72	45	55
Iron ore, head of Lake Superior to Ohio ports, gross ton	40	50	55	53.72	60	70
Iron ore, Marquette to Ohio ports, gross ton	35	45	50	48.72	55	65
Wheat, Chicago to Buffalo, bushel	1.20	1.13	1.43	1.39	1.08	1.44
Wheat, Duluth to Buffalo, bushel	2.25	1.14	2.01	2.02	1.17	1.33
Soft coal, Ohio ports to Milwaukee, net ton	30	30	35	30	32	35.5
Soft coal, Ohio ports to Duluth, net ton	30	30	30	30	32	31
Soft coal, Ohio ports to Portage, net ton	30	30	30	30	32	31
Soft coal, Ohio ports to Manitowoc, net ton	30	30	30	30	31	35.5
Soft coal, Ohio ports to Sheboygan, net ton	30	30	30	30	31	35.5
Soft coal, Ohio ports to Green Bay, net ton	30	30	30	30	31	36
Soft coal, Ohio ports to Escanaba, net ton	30	30	30	30	31	35
Hard coal, Buffalo to Milwaukee, net ton	30	30	35	30	35	41
Hard coal, Buffalo to Chicago, net ton	30	30	35	30	35	41
Hard coal, Buffalo to Duluth, net ton	30	30	30	30	30	31.5
Lumber, head of the lakes to Ohio ports	261	225	256	276	260	234

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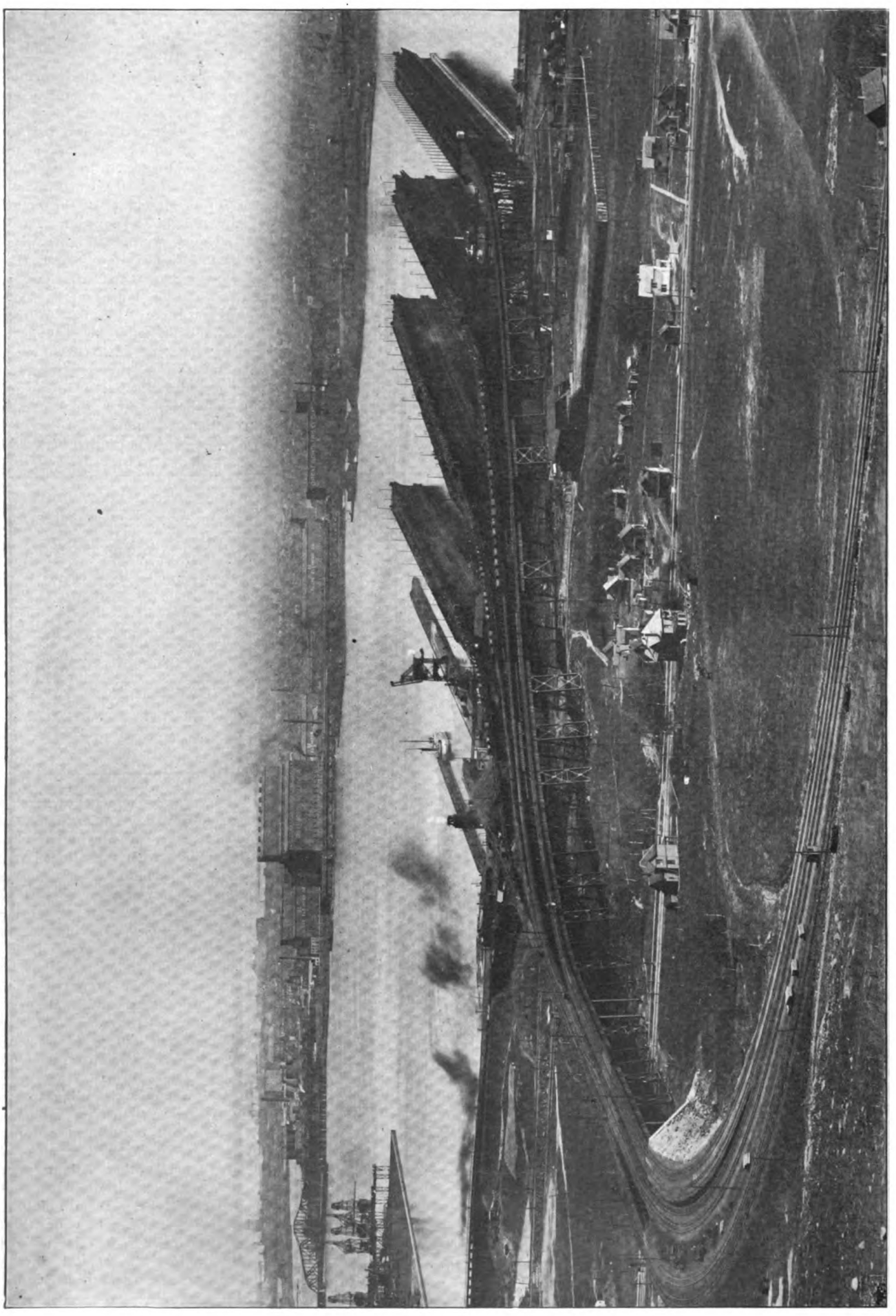

FIG. 1—GENERAL VIEW OF DULUTH, MISSABE & NORTHERN RAILWAY DOCKS AT DULUTH

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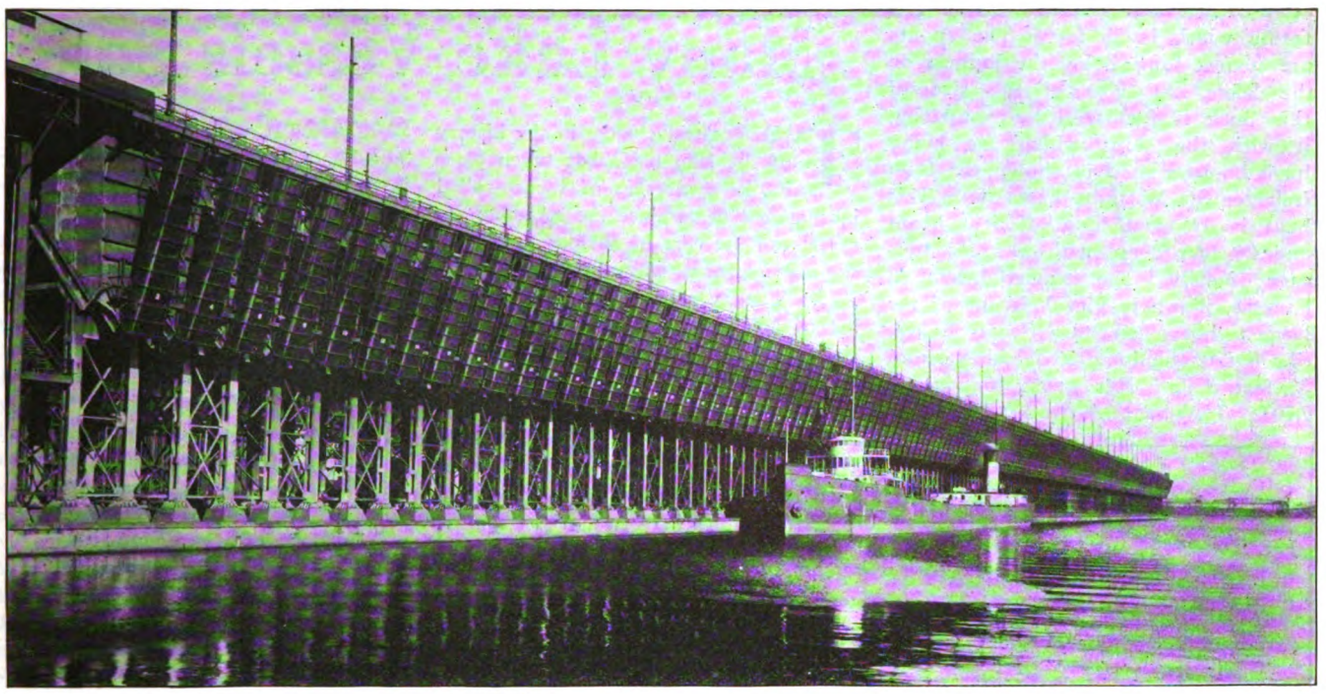

Fig. 2—Bulk Freighter Sir William Fairbairn alongside of new Duluth, Missabe & Northern dock

Large Iron Ore Docks Set Record

THE EQUIPMENT used by the Duluth, Missabe & Northern Railway Co., in handling immense tonnages of iron ore at Duluth, Minn., during the short season of navigation on the Great Lakes, is clearly shown in the accompanying illustrations. In Fig. 1, the four ore docks are shown at the right, the one at the extreme edge of the illustration being dock No. 5, which is said to be the largest loading dock in the world. Adjoining the iron ore docks are smaller docks for handling limestone and lumber. The dock shown at the extreme left is the railway company's coal unloading dock.

The new dock, No. 5, is illustrated in greater detail in Figs. 2 and 3. The first pile for this dock was driven Feb. 8, 1913, and the completed dock began operations April 20, 1915. The dock is 2,304 feet long and has 384 pockets with a storage capacity of 134,400 tons. This ore holding capacity is the largest of any dock on the lakes, No. 1 dock of the Allouez Bay Dock Co. being second with 112,200 tons. The superstructure of the new dock is steel and rests on a concrete base. The height from the water level to the deck is 80 feet, 5 inches, making it the highest dock on the lakes. The height from the water level to the center of the spout hinge hole is 40 feet 9 inches, and the ex-

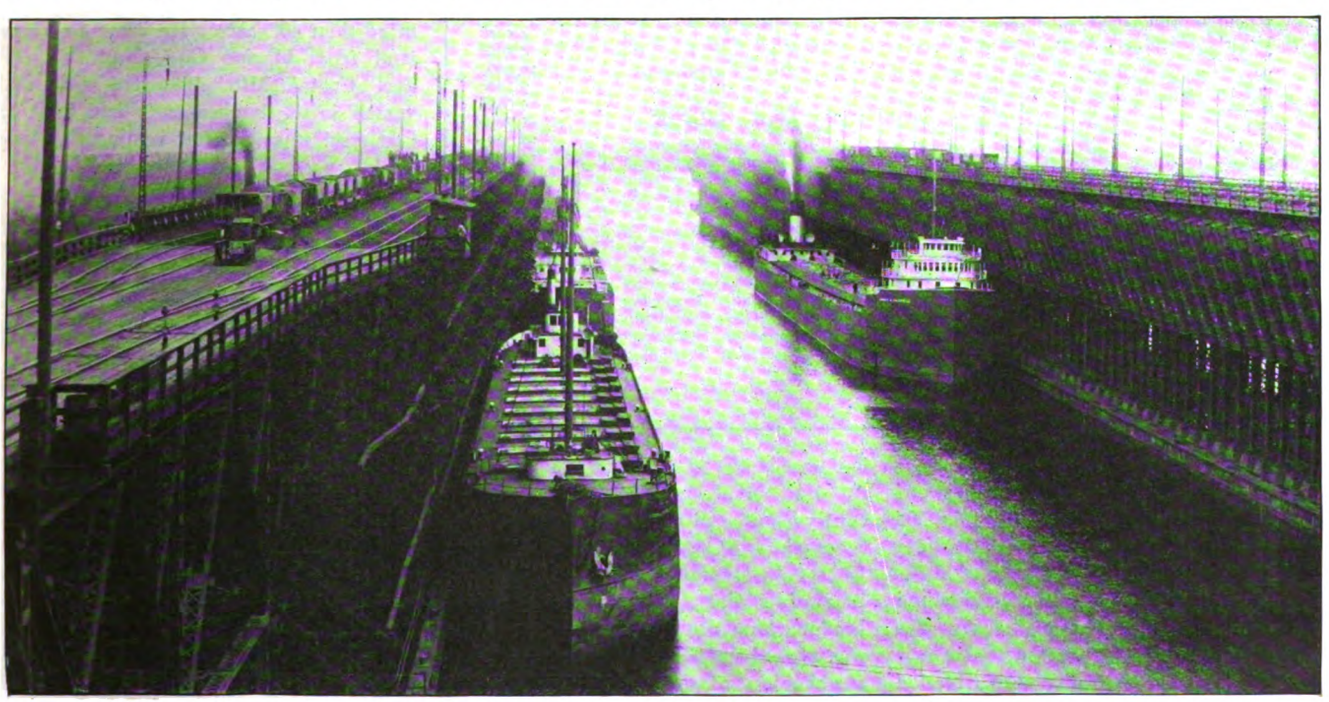

FIG. 3—BULK FREIGHTER JAMES A. FARRELL, ONE OF THE LARGEST BOATS ON THE LAKES, BEING LOADED AT NEW DOCK

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treme width is 56 feet. The spouts are 36 feet long, being the longest on the lakes. An idea of the size of this dock is furnished by comparing it with the ships which are being loaded. In Fig. 2 is shown the bulk freighter SIR WILLIAM FAIRBAIRN. This boat is 425 feet long, 46 feet beam and 28 feet deep, with a gross tonnage of 4,219. The steamer JAMES A. FARRELL, shown in Fig. 3, is one of the largest boats on the Great Lakes. She is 580 feet long, 58 feet beam and 32 feet deep. Her gross tonnage is 7,705. The boat shown in the foreground at dock No. 4 is the barge GEORGE H. CORLISS, and is typical of this class of lake carrier. She is 352 feet long, 44 feet beam and 26 feet deep, having a gross register of 3,259 tons. Several records were established last year by the Missabe docks, the latest mark being set on Saturday, Sept. 4, when 25 boats were loaded with 207,117 gross tons of ore from docks Nos. 3, 4 and 5.

Many Lake Vessels Sold

THE greatest change in the history of the lake trade has taken place in the ownership of the so-called independent fleets since the scramble for vessels on the part of shippers and consuming interests, started about Oct. 1, 1915. The accompanying table gives a list of lake boats which have been sold since the present buying movement commenced, together with the names of the buyers and sellers and the carrying capacities of the vessels involved. A deal involving $3,000,000 was recently put through, the Interlake Steamship Co. taking over the 13 stock steamers of the Cleveland Steamship Co. Both companies have headquarters at Cleveland. The price was agreed upon some time ago and the stockholders of the Cleveland Steamship Co. have ratified the sale. The price which was paid for the boats was about $3,000,000. It was a cash transaction. The boats of the Interlake fleet, which is the second largest on the lakes, being next to the Pittsburg Steamship Co., both in the number of vessels and tonnage, are managed by Pickands, Mather & Co. The company this season will have 52 bulk freighters, 50 being steamers and two barges. A 12,000-ton steamer which is building for the company at the Lorain yard of the American Shipbuilding Co., will come out next June, when the firm will have more than 7,000,000 tons of vessel capacity a season.

The addition of the Cleveland boats will increase the capacity of the fleet about 96,600 tons a trip, or about 1,900,000 tons a season, figuring 20 cargoes for each boat. There are three 10,000-ton ships in the fleet and the capacity of the smallest boat is 5,200 tons. The other nine steamers carry about 7,000 tons each. The boats that were taken over are the steamers A. C. DUSTIN, LOFTUS CUDDY, JOSEPH SELLWOOD, PENDENNIS WHITE, J. J. ALBRIGHT, E. A. S. CLARKE, W. H. GRATWICK, H. S. HOLDEN, M. A. HANNA, W. E. REIS, WALTER SCRANTON, MOSES TAYLOR, LAGONDA.

Captain John Mitchell, who has been at the head of the Cleveland Steamship Co. since it was organized, will remain in the business. He is manager of the Buffalo Steamship Co., which operates the steamers WILLIAM C. AGNEW, HUGH KENNEDY and S. M. CLEMENT, and the Gratwick Steamship Co., which operates the steamer J. J. MCWILLIAMS. Captain Mitchell has been in the vessel business more than 40 years. He came to Cleveland from Marine City about 28 years ago. Captain Mitchell started with small vessels in the lumber trade and built his first steel steamer after coming to Cleveland.

List of Lake Vessels Sold

Name of boat.	Seller.	Buyer.	Capacity, gross tons
E. N. Saunders..	James Davidson	Cleveland Cliffs Iron Co...	6,400
F. M. Osborne..	James Davidson	Cleveland Cliffs Iron Co...	6,400
Steel King	James Davidson	Cleveland Cliffs Iron Co...	6,400
W. S. Mack	Lake Erie Transit Co.	J. A. Paisley	5,300
J. H. Wade.....	W. C. Richardson	Algoma Steel Co.	3,000
Sam Mitchell.....	W. C. Richardson	S. C. McLouth	3,200
Chickamauga	W. C. Richardson	S. C. McLouth	4,300
W. C. Moreland..	Underwriters	R. M. Wolvin	12,000
W. B. Davock....	Vulcan Steamship Co.	Interlake Steamship Co...	7,200
E. L. Wallace....	Dearborn Transit Co.	Cleveland-Cliffs Iron Co...	7,200
Yale	Great Lakes Eng'ring Wks.	E. N. Breitung & Co.	5,700
J. W. Moore.....	F. M. Osborne estate	E. N. Breitung & Co.	3,200
J. H. Bartow....	Erie Steamship Co.	Cleveland-Cliffs Iron Co...	9,500
Luzon	Erie Steamship Co.	J. A. Paisley	5,400
Panay	Erie Steamship Co.	J. A. Paisley	5,400
S. S. Curry.....	Hawgood Transit Co.	W. H. Becker	6,500
C. W. Kotcher...	Detroit Steamship Co.	Wilson Transit Co.	7,400
G. A. Tomlinson..	Douglass Steamship Co.	Pioneer Steamship Co.	9,500
E. Zimmerman....	John Craig	Cleveland-Cliffs Iron Co...	8,500
G. L. Craig.....	John Craig	J. A. Paisley	5,800
Thomas Adams....	John Craig	J. A. Paisley	5,800
Milinokett	H. L. Shaw	Cambria Steel Co.	9,200
P. J. Ralph.....	Colbeck Trans. Co.	O. W. Blodgett	1,200
Charles Weston...	Frontier Steamship Co.	M. A. Hanna & Co.	10,500
D. B. Meacham...	Frontier Steamship Co.	M. A. Hanna & Co.	10,200
J. G. Munro.....	Frontier Steamship Co.	M. A. Hanna & Co.	10,200
James Corrigan...	Frontier Steamship Co.	M. A. Hanna & Co.	10,200
W. A. Rogers....	Niagara Transit Co.	M. A. Hanna & Co.	10,000
P. P. Miller.....	Miller Steamship Co.	W. H. Becker	5,700
Wainwright	Wainwright Steamship Co.	W. C. Richardson	7,200
M. A. Bradley....	Alva Steamship Co.	H. H. Brown & Co.	8,000
A. G. Brower.....	Great Lakes Steamship Co.	W. H. Becker	5,400
W. W. Brown....	Great Lakes Steamship Co.	W. H. Becker	5,400
Bransford	Acme Transit Co.	Pittsburgh Steamship Co..	6,800
J. M. Jenks.....	Acme Transit Co.	Pittsburgh Steamship Co..	6,800
H. B. Hawgood...	Acme Transit Co.	Pittsburgh Steamship Co..	6,800
Edwin F. Holmes..	Acme Transit Co.	Pittsburgh Steamship Co..	6,800
Umbria	Acme Transit Co.	Pittsburgh Steamship Co..	6,800
Wisconsin	Acme Transit Co.	Pittsburgh Steamship Co..	6,800
Wm. Livingstone..	G. A. Tomlinson	W. C. Richardson	10,200
H. D. Goulder....	G. A. Tomlinson	W. C. Richardson	9,700
Senator	P. H. McMillan	W. C. Richardson	6,000
Colonel	P. H. McMillan	W. C. Richardson	5,700
A. C. Dustin.....	Cleveland Steamship Co.	Interlake Steamship Co...	10,000
Loftus Cuddy.....	Cleveland Steamship Co.	Interlake Steamship Co...	10,000
Joseph Sellwood...	Cleveland Steamship Co.	Interlake Steamship Co...	10,000
Pendennis White..	Cleveland Steamship Co.	Interlake Steamship Co...	7,000
J. J. Albright....	Cleveland Steamship Co.	Interlake Steamship Co...	6,800
E. A. S. Clarke...	Cleveland Steamship Co.	Interlake Steamship Co...	6,800
W. H. Gratwick..	Cleveland Steamship Co.	Interlake Steamship Co...	6,800
H. S. Holden.....	Cleveland Steamship Co.	Interlake Steamship Co...	6,800
M. A. Hanna.....	Cleveland Steamship Co.	Interlake Steamship Co...	6,800
W. E. Reis.....	Cleveland Steamship Co.	Interlake Steamship Co...	6,800
Walter Scranton...	Cleveland Steamship Co.	Interlake Steamship Co...	6,800
Moses Taylor.....	Cleveland Steamship Co.	Interlake Steamship Co...	6,800
Lagonda	Cleveland Steamship Co.	Interlake Steamship Co...	5,200
Total, 56 vessels			396,300

The steamship MONGOLIA, one of the four big cargo carriers purchased from the Pacific Mail Steamship Co. to be operated under the American flag by the Atlantic Transport Line, arrived in New York recently after a voyage from San Francisco.

The oil tank steamer CATANIA has been sold by the Coast Oil Co., San Francisco, to the Mexican Petroleum Co., at a price said to be about $130,000. The vessel was badly damaged on the lower Pacific coast last October and at present is at the Union Iron Works Co. yards in San Francisco, being repaired, after which she will load oil from that port for Rio de Janeiro, and then be permanently transferred to the Atlantic trade.

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What the Government is Doing

Rulings on Marine Matters **Improvements to Waterways**

Hints to Navigators

Inspection Service Wants Larger Power

IN THE annual report of the supervising inspector general of the steamboat inspection service to the secretary of commerce for the fiscal year ended June 30, 1915, the statistical record of work shows certificates of inspection issued to 7,232 steam, sail and motor vessels and barges, aggregating 5,612,031 gross tons; 321 foreign passenger steam vessels, aggregating 2,111,008 gross tons, were inspected; 18,412 officers of all grades were licensed; 62 steam vessels were granted letters of approval of designs of boilers, engines and other operating machinery; 91 government vessels were inspected and 1,681 boilers in or for United States government steamers and buildings were inspected. Re-inspections of passenger and ferry steamers made by boards of local inspectors numbered 3,120. Assistant inspectors tested 2,962 marine boiler plates at the mills and also inspected there a large number of steel bars for braces and stay bolts in marine boilers and several hundred plates for stock and repairs. Many requests from other branches and departments of the government for tests of material at the mills were complied with and reports rendered to the proper officials. New life preservers inspected numbered 161,335, of which 217 were rejected.

Accidents Less in Number

During the year, 5,022 applicants for original and renewal of licenses were examined for visual defects, 4,962 of whom were passed.

Reports covering casualties and violations of law by vessels subject to inspection numbered 1,669. Accidents resulting in loss of life totaled 190, 42 less than the previous year. During the year 307,348,008 passengers were carried on steam vessels required by law to report the number of passengers carried. Dividing this number by 107, the total number of passengers lost, shows 2,872,411 passengers carried for each passenger lost. The total number of lives lost from all causes, passengers and crew, was 368. This does not include the big EASTLAND disaster on July 24, 1915.

The card index system used throughout the service is an important factor in connection with administrative methods. The bureau appreciates that a card index system is but a paper record, and that it of itself does not prove that the inspection is effective, but the system has proven a powerful instrument for the maintenance of a high standard of inspection. The practice of the service is that records shall be made daily and reports rendered daily, rather than at the end of a month or a quarter or six months. Thus, there is always immediately available the very latest information in regard to all of its operations.

A most important means of obtaining uniform administration and improving the work of the service has been through the efforts of the traveling inspector. His chief duty is to ascertain whether the local inspectors have been correctly inspecting vessels; and that his appointment is justified is proven by his reports, for numerous instances of defective and imperfect inspection have been discovered.

The force of inspectors employed in this service is believed to be too small. For several years the bureau has in its estimates pointed out the necessity of additional inspectors. Also the salaries of inspectors and clerks have not kept pace with the money paid for similar service outside of the government. As men become trained they leave. These conditions, unfortunate as they are, do not compare with that confronting this service in June, 1915, for it was necessary on June 10 to order that all re-inspections cease.

The bureau's plan has been to create in the office of the supervising inspector general a corps of experts, whose business it would be to approve proposed hull construction. In order to do this, legislation is necessary. If the construction of a vessel could be so approved, there would result not only safe conditions with reference to construction, but also more uniformity in the matter of correct inspection and construction.

Unfortunate as was the disaster to the steamer EASTLAND, the matter of hull inspection and construction is one that has not been neglected, and as a result of that terrible disaster, it may be possible to obtain the larger appropriation necessary for a larger and more effective service.

Closely connected with the proposition of hull construction is that of the overloading of passenger steamers, a question also considered at length in previous annual reports. It is believed that violations of law by steamers in carrying more passengers than allowed by their certificates of inspection are comparatively few. The important question is, have the local inspectors permitted a steamer to carry a larger number of passengers than she should be permitted to carry? In this connection not only must the stability of the vessel be considered, but also the possibility of panic and the handling of the life-saving apparatus in such event. The conclusion is that the original responsibility rests upon the local inspectors in the matter of passenger allowance. The bureau has endeavored to impress upon them the seriousness of this responsibility and condemns in unqualified language any exercise of their great authority without full appreciation of its seriousness.

Bureau on the Defensive

While all eyes are turned toward stability tests for vessels, other perils as terrible should not be forgotten. The possibility of fires on excursion steamers always exists, and though there may be ary number of regulations in regard to fire-fighting equipment, the best way is to remove the cause and require fireproof construction. This cannot be done until congress acts, and the bureau most earnestly invites attention to the necessity for legislation in this respect. In connection with fires is to be considered the transportation of danger-

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ous articles. The law does not by any means meet modern conditions. It is possible today to transport certain dangerous articles not covered by the law on steamers carrying passengers, and over such a situation the bureau has no control. Further, the bureau has no control over the transportation of dangerous articles on freight steamers, although the lives of persons on passenger steamers may be jeopardized through carelessness on freight steamers. The office of the supervising inspector general should be given authority to regulate dangerous practices.

The board of supervising inspectors at its last annual meeting adopted rules and regulations consistent with the provisions of the seamen's act. The bureau purposes to maintain a complete index of the names of all persons obtaining certificates as able seamen or life boat men, thus making available in the office of the supervising inspector general very valuable information for the use of the government and of the seamen themselves should information be requested with reference to persons who hold such certificates.

Wants a New District

The first supervising inspection district is manifestly too large for proper supervision by one man and its division is again urged. According to the division proposed, the new district to be created would consist of the local inspection districts of Seattle, Wash., Portland, Ore.; Juneau, Alaska, and St. Michael, Alaska, with headquarters at Seattle; and the old first district would include the local inspection districts of San Francisco, Cal.; Los Angeles, Cal., and Honolulu, Hawaii, with headquarters at San Francisco, Cal.

The branch hydrographic office, operated by the United States government at Cleveland, has issued a circular calling the attention of mariners to the facilities afforded for the study of navigation. The circular states that the office is provided with a complete set of nautical books, charts and instruments, which may be used at any time and that the lieutenant in charge will be glad to give any information or instruction in navigation that may be desired. This service is entirely free.

Capt. C. Lucas has been placed in command of the American Line steamer PHILADELPHIA, taking the place of Capt. Arthur H. Mills, who now commands the steamer ST. PAUL, in the place of Capt. Passow, retired. Captain Mills was the master of PHILADELPHIA for 15 years.

Reports on Radio Affairs

ACCORDING to the annual report of the commissioner of navigation to the secretary of commerce for the fiscal year ended June 30, 1915, the merchant marine of the United States, including all kinds of documented shipping, comprised on June 30 last, 26,701 vessels of 8,389,429 gross tons, as compared with 26,943 vessels of 7,928,688 gross tons one year earlier. The year's absolute increase in tonnage, 460,741 gross tons, has never been equaled in our history. While the total tonnage has increased, the number of documented vessels has decreased 242, sailing vessels alone decreasing 593 in number. The decline in the number of vessels with an increase in the total tonnage is a normal result of the development of water transportation. The size of vessels has been steadily increasing since steel and steam came into general use. In tonnage and value the merchant shipping under the American flag is surpassed only by that under the British flag, and in tonnage it equals that under any other two foreign flags combined except the British.

American shipping registered for the foreign trade, included in the figures above, numbered on June 30, 1915, 2,794 vessels of 1,871,543 gross tons, an increase during the year of 389 vessels and 795,391 gross tons. This increase is three times as great as the increase in registered tonnage during any previous year in our history.

Tonnage enrolled and licensed for the coasting or domestic trade on June 30, 1915, numbered 23,907 vessels of 6,517,886 gross tons, a decrease of 631 vessels and 334,650 gross tons since June 30, 1914.

The receipts from tonnage duties during the year ended June 30, 1915, were $1,315,425.30, compared with $1,310,759.03 for the previous year, and are the largest annual receipts from this source in over 30 years. Tonnage duties are collected on the net tonnage of ships on not to exceed five entries during the year at the rate of 6 cents on voyages from foreign ports across the ocean and at the rate of 2 cents on the shorter voyages from foreign nearby ports in the western hemisphere. The receipts from navigation fees for the year amounted to $142,466.27, a decrease of $10,247.82 compared with last year and the collections from navigation fines during the year amounted to $41,518.24, an increase of $776.86 over the previous year. The organization of the radio field force to carry out the laws relating to wireless communication has been improved during the year and in consequence it has been possible to carry on more fully the inspection system through the seaboard states and the states bordering on the Great Lakes. The field force now consists of 12 inspectors and more territory is covered than heretofore. The number of ship inspections this year was 6,155, compared with 6,484 for the previous year, the decrease being due to the fact that many of the large transatlantic passenger liners have been withdrawn and smaller cargo boats not required to carry wireless apparatus and operators have taken their places in the export-carrying trade. The inspection of ships is the most important work of this service and it has been carried out more thoroughly in 1915 than formerly, although fewer inspections were made.

Many Amateur Operators

The number of land stations inspected was 560, compared with 368 for the previous fiscal year, and the number of operators examined as to qualifications was 3,194, compared with 2,245 for 1914. The total number of stations licensed was 4,039, compared with 2,309 during the preceding fiscal year, and the total number of licenses issued to operators was 4,859, compared with 1,548 during 1914. The total number of operators licensed including amateurs, is 10,973.

The bureau has begun to assemble records of marine casualties in which the wireless system on ships inspected by the department contributed to the saving of life and property. Incomplete returns for the past fiscal year show 36 such casualties and in every instance the apparatus worked satisfactorily, the auxiliary set taking up the work of the communication when the main set, through the nature of the casualty, was put out of commission. Radio operators have set for themselves high standards of courage and devotion to duty.

During the fiscal year ended June 30, 1915, 6,860 violations of the navigation laws were reported from all sources. This was an increase of 140 cases over the previous year, which was the largest then on record. Reports submitted from the field force show a marked improvement on the part of all classes of vessels in complying with the navigation laws. The increase in the number of violations reported is due to the increased facili-

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ties for inspection and attention given to the work.

During the year the motor vessel TARRAGON was employed along the New England coast during the summer and in the oyster fleet in Chesapeake Bay during the winter. On the waters covered by the TARRAGON it is estimated that she was able to inspect approximately 5 per cent of the vessels. The effect of the work last year, however, is apparent. At that time approximately one out of every three vessels inspected was found without some item of equipment. During the year 1915 the average was raised so that approximately one out of every five was without some item of equipment, an improvement of 66 per cent. In some districts this average is very much better. A material improvement in the condition of the crews was observed from the work in the oyster fleet. The quarters were protected better from the sea and weather, and the food furnished more abundant and of better quality.

During the year the bureau employed 61 navigation inspectors to prevent the overcrowding of passenger vessels. These inspectors served in connection with the regular customs inspectors, 5,061 counts involving 1,439,273 passengers, being made by the navigation inspectors while the customs officers made 5,586 counts of 1,619,445 passengers; total, 10,647 counts of 3,058,718 passengers. In addition to this work the navigation inspectors reported 999 violations of the navigation laws, work never before undertaken by these men.

The total number of seamen shipped, reshipped and discharged by the shipping commissioners was 414,744, compared with 378,772 during the previous fiscal year, the increase being attributable almost wholly to the ship registry act.

Motor boat builders are taking much interest in the navy department's efforts to develop fast motor driven patrol boats to be carried on the decks of battleships and used against submarines. Four builders have submitted bids to construct the first boat, which will have a speed of 41 land miles an hour, a cruising radius of 150 miles and will carry an 18-inch torpedo tube and a one-pounder quick-fire gun. Prices range from $18,000 to $60,000. Similar craft have been used effectively by Great Britain against German submarines.

San Francisco news dispatches state that the American steamship COLON, formerly under the Mexican flag, has been sold by Bennett & Goodall to the Pacific Commercial Co., San Francisco, for $75,000.

Report of Coast Survey

THE annual report of the superintendent of the United States coast and geodetic survey to the secretary of commerce discusses the work accomplished during the year, and the conditions and needs of the survey. Reference is made to the inadequacy of the present offices and the need of new buildings, properly designed and equipped. A graphic description of the hydrographic work is given on four maps whereon the work already completed, the work partly finished, and that remaining to be done, are shown in different colors.

The lack of suitable vessels for the work of the survey is dwelt upon at length. Three of the old vessels have been condemned during the year as no longer safe, on account of age and structural weakness; two others are for the same reasons only fit for service in sheltered waters; only one vessel now in commission is altogether fit for work offshore; and she is in the Philippines. The report urges the building of two additional vessels of suitable size and equipment to take up offshore work in Alaska and elsewhere as required. Much of this work is needed off the coasts of California, Oregon and Washington.

The wire-drag work has hitherto been carried on at a great expense with chartered launches ill adapted for the purpose. It is hoped to remedy this unsatisfactory condition by providing vessels and launches suitable in type, size and equipment for the work they are to perform. Two types of vessels are therefore needed; one for offshore work, and another for inshore and inside hydrography, and wire-drag operations. Six new vessels of the smaller type, suitable for wire drag work and for one-party inshore hydrography, are needed on the Atlantic and Gulf coasts, and six more on the Pacific coast. The building of the two large vessels will perimt the survey to take up the offshore work on the Pacific coast which is greatly needed.

Sounding Methods Revolutionized

As a result of the increased appropriation last year, it was possible to place four wire-drag parties in the field, instead of two. The results prove the wisdom and necessity of doing this work on a much larger scale. The use of the wire drag has revolutionized hydrographic surveying. It has been realized that soundings with the leadline, no matter how carefully and closely spaced, were not infallible, and that submerged rocks and ledges were often missed, as has been demonstrated by numerous wrecks, and frequent damage due to striking unknown rocks in surveyed waters; but with the development of the wire-drag hydrography these submerged dangers have been discovered and charted.

The importance of having the geodetic work of the country done by the government rather than by individual states is dwelt upon at length, with the conclusion that our government should complete the general program which is being followed by the United States coast and geodetic survey. This plan is, briefly, that the primary triangulation scheme, and the precise level net should be so extended that there will be no place in the United States 100 miles distant from a primary triangulation station, or a precise level bench mark, Besides this work in the interior of the continent, triangulation is needed in the interior of Alaska, across the Alaska peninsula, and from the Dixon entrance to White pass.

The purchase of Dutch harbor, Alaska, as a government supply base in western Alaska is advocated. This would greatly benefit the coast and geodetic survey, the bureau of lighthouses, and the coast guard. Retirement for officers of the coast and geodetic survey, similar to that given to the coast guard service, is recommended.

Will House Canal Officers

Authority has been granted for the erection of a 3-story concrete building alongside the new docks at Balboa, Canal Zone, to serve as a canal terminal office building. It will house the offices of the captain of the port on the third floor, offices of the receiving and forwarding forces of the Panama railroad on the first floor, and the second floor will be available for lease to the representatives of steamship lines, or other maritime interests, or for the use of other departments of the Panama canal which may require offices on the water front.

The project calls for between 3,000 and 3,600 square feet of floor space on each floor, exclusive of porches. The preliminary sketches provide for a building 146 feet long by 42 feet wide, over all, with porches along the front and ends. The general features of construction will harmonize with those of the shops office building, which is now housing the offices of the port captain, customs officers, and representatives of the supply department, in addition to the offices of the mechanical division, for which the building was erected. The canal terminal office building will be readily accessible.

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Late Decisions in Maritime Law

Legal Tips For Ship Owners and Officers

Specially Compiled for The Marine Review

By Harry Bowne Skillman

Attorney at Law

THE question of general average contribution rests, it was decided in Pittsburgh & Erie Coal Co. v. George Urban Milling Co., 226 Federal Reporter 332, upon equitable grounds, and renders the vessel liable only for her fault, and not for an error of judgment on the part of the navigator, as a result of which an accident occurs, to the injury of the cargo.

* * *

A wharf owner who directed that a heavily loaded barge be placed in an unsuitable berth, where at low tide she rested on the bottom, was declared, in C. F. Harms Co. v. Upper Hudson Stone Co., 225 Federal Reporter 630, to be liable for injuries resulting, it appearing that the owner had notice of conditions. The tug leaving such barge was absolved from fault, the condition of the berth not being apparent.

* * *

A barge lying alongside a bulkhead between 134th and 136th streets on the west side of East river, New York, was held, in Henry Steers, 226 Federal Reporter 818, to not be in a channel, but in a place which was virtually a slip, and hence was not in fault when struck and injured by a boat in tow of a tug, which was bringing it up to the south of the 136th street pier.

* * *

The liability of a city for injuries occurring in a harbor was passed on in the case of Jolivet v. City of Seattle, 226 Federal Reporter 963, where the court said: "Where the municipality has control of the waters and of the buoys, and maintains supervision of the anchorage grounds, and issues permits for harbor privileges, and makes a charge therefor, it is liable for damage caused by negligence in the discharge of the assumed duties."

* * *

It was shown in the case of CITTA DI PALERMO, 226 Federal Reporter 529, that damage was done to a shipment of hides from sea water, which entered through holes in the plates of a steamship where the outer ends of the rivets were gone, but the court decided that in the absence of evidence that such rivets were in good condition when the voyage commenced, that the defects were latent and could not have been discovered by proper inspection, or that they were in fact examined when the vessel was last inspected several months before, the steamship was liable.

* * *

The case of PLEASURE BAY, 226 Federal Reporter 55, enumerates the elements to be considered in case of salvage service as follows: "The labor expended by the salvors in rendering the service. Promptitude, skill and energy displayed in rendering the service and saving the property. The value of the property employed by the salvors, and the damage to which such property was exposed. The risk incurred by the salvors in securing the property from the impending peril. The value of the property rescued. The degree of danger from which the property was rescued."

* * *

Article 25 of the Rules of Navigation of Inland Waters, providing that in narrow channels every steam vessel shall, when it is safe and practicable, keep to that side of the fairway or mid-channel which lies on the starboard of such vessel, was recently construed in the cases of SANTA MARIA, 227 Federal Reporter 149, and BELFAST, 226 Federal Reporter 302. In the former case it was declared that such article is not absolute, but applies only when the course is safe and practicable, and that it is subject to the "special circumstances" provision of article 27. The latter case held that the article is a rule of the road and defines the respective rights of moving vessels in narrow channels, and that as against a vessel not proceeding, but wrongfully lying at anchor, the right of a traveling vessel is superior in any part of the channel.

* * *

As a general proposition, a boat coming out of a slip, blowing a slip whistle, must give a proper warning by the slip whistle to everything that is not visible to the lookout of the boat, and also it must so conduct itself that it can avoid running down any boat that may be in a position to be mislead, or not able to protect itself, at the warning of the slip whistle. If a slip whistle is blown, and the boat coming out finds a vessel in the way coming from the right, or the starboard, then all the rules of navigation, including the starboard hand rule, put upon the vessel coming out the burden of using the proper maneuver, or choosing the proper course, to avoid any injury that cannot be prevented by the mere giving of the slip whistle.—James P. McGuirl, 225 Federal Reporter 662.

* * *

The effect of state legislation on maritime law was considered in the case of Swayne & Hoyt v. Barsch, 226 Federal Reporter 581, where it was observed that the maritime law of the United States subsists as an entirety, of which federal courts have exclusive jurisdiction, and must be administered by them unaffected by state legislation. Plaintiff in the case was injured while working on a dock at Portland, Ore., in discharging a vessel, and the court held that the Oregon employers' liability law, providing that whenever necessary for the safety of persons employed in and about it, all machinery not operated by hand power shall be provided with a system of communication by means of signals, was applicable, since the case was not within the admiralty jurisdiction. It was further said that the state law was not rendered inapplicable by the fact that plaintiff's contract of employment was a maritime contract, since he was suing, not upon the contract, but on the ground of negligence.

* * *

An interesting case growing out of the European war is that of EPSOM, 227 Federal Reporter 158. Certain seamen signed shipping articles in England, in February, 1914, for three years' service on a British steamship for a voyage to certain North and South American ports. When reaching a South American port it was learned that the war had commenced and that German cruisers were attacking British merchant vessels, and one of the German cruisers entered the port for coal. The ship carried a cargo of contraband articles destined for London, and on leaving the port the ship's lights were, by order of her officers, darkened. It was decided that the risks occasioned by the war were extraordinary, and, hence, that the seamen were justified in refusing to proceed under the articles signed by them. The court said: "They agreed to serve on a voyage attended by the risks of peace, and not on a voyage attended by the risks of war." The seamen being American citizens, a question of jurisdiction was raised, and the court made the interesting decision: "An American citizen, when he signs shipping articles and steps upon a British ship, flying the British flag, becomes entitled to the protection and the benefit of the British law as fully as a British subject; but he does not thereby forfeit his citizenship, nor his right to redress wrongs in the courts of his own country. The right to invoke the jurisdiction of the federal courts by a citizen of the United States for the purpose of determining a dispute under shipping articles with a foreign vessel is a constitutional right, which the courts cannot deny."

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Seattle Completes Unique Terminal

Puget Sound Port Development Includes Observatory and Public Playground, Not to Mention Wharf, Warehouse, and Cold Storage Facilities

By Robert C. Hill

REPRESENTING a million dollar investment, the recently completed Bell street terminal of the port of Seattle includes not only a thoroughly modern wharf, but also an up-to-date warehouse and cold storage plant, elaborate and luxurious offices for the port officials, and a public observatory and playground. It is one of several units comprised in a plan devised by Seattle's port commissioners for the development of the city's harbor facilities. It is frankly an experiment in public ownership. That it will be a success financially is far from certain; but whether or not the terminal eventually justifies its cost, it is admittedly a model of modern marine architecture, embodying every late idea for a plant of its kind. Situated on deep water, it affords every facility for the rapid and economical handling of large and small vessels. The location has been subjected to much criticism. Though known as the central waterfront, it is a considerable distance from the heart of the present local water traffic, though close to the city's largest public market. One of the reasons for its existence, as submitted to the taxpayers by the commissioners when bonds were voted for its construction, was the need of wharf and storage facilities for Puget sound truck farm and dairy traffic tributary to Seattle. The commissioners also felt it their duty to provide berthing facilities for city and government craft, vessels of the navy department, those of the coast and geodetic survey, the lighthouse service, the coast guard service, and other government craft which make Seattle their headquarters.

Out of the sum of $6,100,000 authorized three years ago for immediate port improvement, the port appropriated $750,000 for the central pier and warehouse. When the present site was selected, condemnation proceedings were brought to acquire title to the property, for which $92,000 was paid. Construction of the wharf, begun three years ago, was completed in 1914. In the meantime, contracts for the concrete warehouse, cold storage plant and offices were awarded, this latter unit being completed recently. The wharf has a frontage of nearly 1,200 feet,, capable of berthing vessels of the largest size and deepest draught. The interior portion of the pier is a solid fill, its material having been obtained from a regrade project from which the earth was sluiced to tidewater. The filled portion is approximately one acre in area, and is now improved with a five-story concrete warehouse and cold storage building. The wharf is two stories in height. Its second story communicates by overhead viaduct with the business streets.

The warehouse, including general offices, cold storage plant and public warehouse space, is 422 feet long and 80 feet wide. The north 100 feet constitutes a cold storage plant of five floors, a sixth or basement floor housing the refrigerating machinery. Three floors of the south 100 feet include the ordinary warehouse section. On the fourth floor are about 30 luxurious offices, including those of the port commission, which requires a dozen. The others are available for tenants, being particularly adapted to the use of government officials.

Its unobstructed view of the entire harbor makes the roof of this warehouse an ideal observatory. It has also been fitted for a public playground. Situated in a district where some of the poorer classes reside, and where no parks are available, this playground would seem to be strategically located. It is equipped with cement floor, cement balustrade, globe lights and attractive shelter house, and, in co-operation with the park board, with swings, slides and similar devices.

The commissioners plan to provide ramps of easy grade connecting with the streets, so that motor trucks and teams can reach any part of the wharves or warehouses without difficulty. A viaduct will extend along the entire Railroad avenue front of the port building, connecting at either end with the second story of the Bell street wharf, with public spur tracks below to serve the warehouse and cold storage plant. Common user franchises in Railroad avenue enable all railroads to reach the Bell street terminal. The Northern Pacific and Milwaukee railroads have already availed themselves of this privilege. Overhead bridges connecting the second story of the

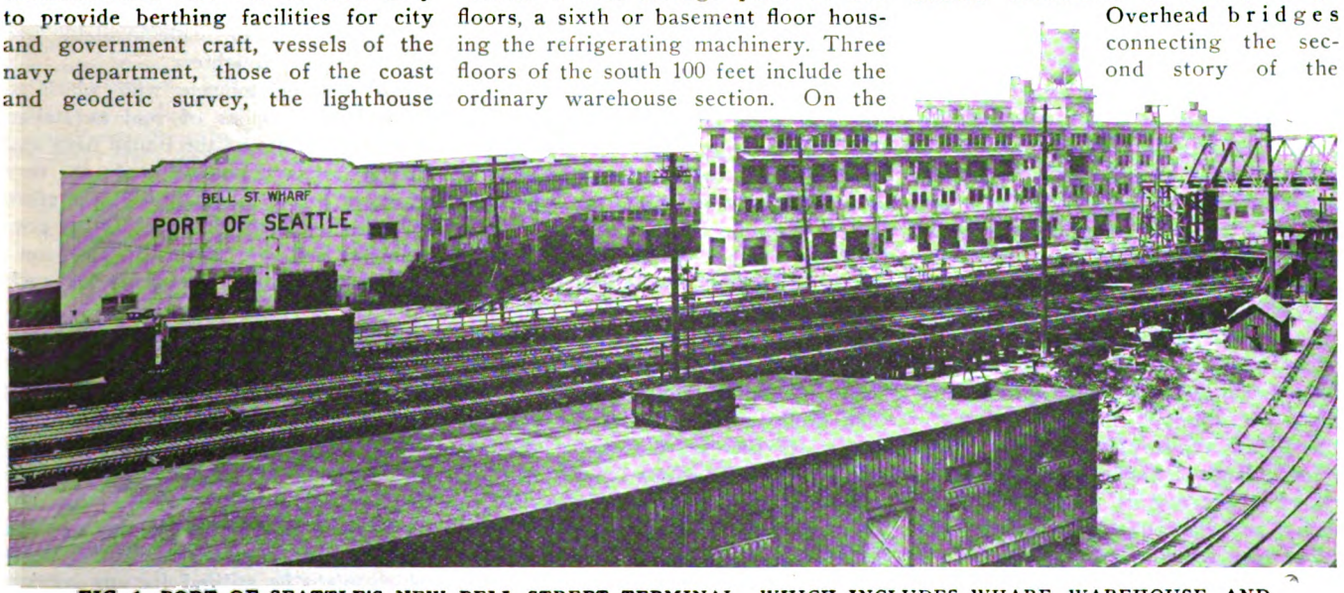

FIG. 1—PORT OF SEATTLE'S NEW BELL STREET TERMINAL, WHICH INCLUDES WHARF, WAREHOUSE, AND COLD STORAGE PLANT, PORT OFFICES, PUBLIC PLAYGROUND AND MARINE OBSERVATORY

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wharf with the warehouse and cold storage plant, when completed, will allow the use of electric equipment for handling freight between ship and rail.

The first floor of the wharf has been in use since early in 1914, during the construction of the warehouse and viaducts. Two or three large vessels with coal from the Atlantic coast have thus far discharged at this wharf. Last year the Bell street wharf, in conjunction with the Whatcom avenue warehouse, another unit of the port commissioners' scheme, handled 825,000 cases of salmon. Seattle is the center for a very important canned salmon business and during the latter part of the year considerable demand exists for fish storage space.

The warehouse will be operated directly by the commissioners, warehouse receipts being given on goods

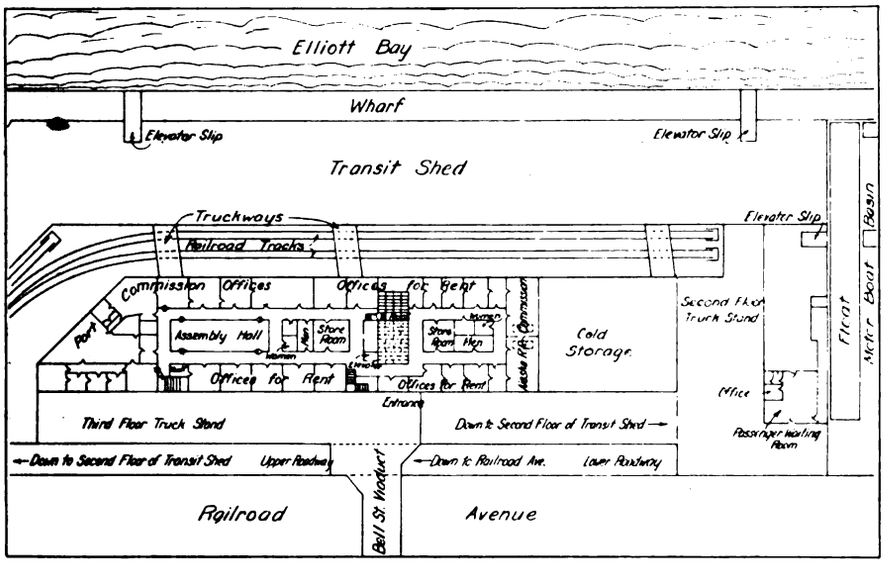

FIG. 2—OFFICE FLOOR PLAN OF PORT OF SEATTLE'S BELL STREET TERMINAL

stored, and all required services being furnished at cost plus 10 per cent, including loading and unloading of cars, conditioning and accounting for goods, etc. Both wharf and warehouse are equipped with sprinklers and other fire protection facilities, thus obtaining for the contents the lowest insurance rates. The three floors devoted to ordinary storage comprise 41,478.8 square feet, capable of storing 243,829 cases of salmon. The wharf has a total floor area of 52,080 square feet, sufficient to store 273,444 cases of salmon.

Seattle is the shipping point for most of the many thousand boxes of apples raised in the eastern portion of Washington and adjacent states. The port commissioners concluding that more cold storage space was necessary to care for this freight awaiting shipment by water, determined to enter the business of providing such facilities. Correspondence with fruit associations in eastern Washington indicated that 50,000 cars of fruit will be available for shipment during the season of 1916. It is estimated that fully half of this crop must move by water through Seattle. The port commissioners anticipate that their cold storage space will be in demand within a short time for apples, meats, poultry, vegetables and other perishables awaiting water shipment to the Atlantic seaboard, Australia or Europe. In providing this facility, it was borne in mind that the primary necessity was adequate cold storage space at a minimum charge and so situated that the perishable cargo can be placed aboard ships without delay. Before the opening of the Panama canal, Australia was a heavy purchaser of Washington apples. Since the completion of the canal, new markets for Washington's perishable products have been opened. With large steamers of considerable cold storage space available, the commissioners expect a continuous demand for refrigerated space. The cold storage plant at the Bell street terminal is so arranged that the facilities may be increased if occasion demands. The five floors are insulated and served with refrigerating pipes, providing a storage area of 19,919 square feet, sufficient for 92,637 boxes of apples.

In addition to its cold storage capacity, its recreation features and office space, the wharf can berth all classes of vessels from a rowboat to a large ocean liner. It has space for berthing three 400-foot ships at the same time, while its quay front will accommodate the largest ships afloat. On the north side is an open wharf breakwater, protecting a basin containing floats to be used as landings for motor boats and pleasure craft. It is here that the commissioners expect the small craft from neighboring farm and ranch districts to discharge cargoes of fruits, vegetables and poultry. Their primary object is to make this improvement the watergate to the retail district, so that farm produce may either be placed in cold storage or delivered at the markets without delay.

Among the wharf's features is an assembly hall with a seating capacity of 250, suitable for public use. Another is the Kinnear steel rolling doors. These are constructed with roller bearings, so that they can be easily operated at any time by hand. In case of fire they will close automatically when the temperature reaches 150 degrees Fahr.

Italy Will Use German Steamers

Thirty-six German steamers, of an aggregate gross tonnage of 153,866 tons, which had been detained in Italian ports from the beginning of the war, have been seized by the Italian government and will be used in various services for that government, according to advices received by mail. This step was taken in the last week of November, it is stated, despite the fact that no declaration of a state of war existing between Germany and Italy has been issued.

The action of the Italian government in commandeering the services of the 36 German steamers held at Italian ports, it is believed, was taken in an effort to remedy the acute shortage of tonnage for important services of the Italian government, shipping men in New York pointing out that most of the boats which will thus be made available are large capacity freighters.

Coal-carrying tonnage with which to bring large supplies of coal to Italian ports for the use of the Italian navy and railways, has been reported as very scarce in recent months. It is therefore regarded as likely that the Italian government will use some of the commandeered German steamers for such service.

German owners of the interned steamers commandeered at the Italian ports, it is believed, will be compensated for the use of their vessels at the close of the war, by the Italian government. This action would be similar to that which the British government officially announced it would take in the case of interned enemy vessels at British ports which might be utilized for any service. The point was made at the time of the British declaration in this connection

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that the British government would hold itself liable for compensation to the owners of the interned steamers which it might utilize for service and also for any damage or loss which might result from such use, although no compensation would be made for depreciation or wear and tear. The Italian authorities will probably follow the same plan.

Following is given the list of the German vessels held at Italian ports which will probably be affected by the seizure for service order of the Italian government, together with the tonnage of each vessel, the name of the owners and the respective ports at which they were detained:

Name, Where Detained and Owners—	Gross tons.
Albany—Syracuse, Deutsch-Australische, D. G.	5,882
Algier—Palmero, Robt. M. Sloman Jr..	3,127
Amalfi—Leghorn, Robt. M. Sloman Jr..	1,756
Ambria—Syracuse, Hamb'g-Am'n Line..	5,143
Axenfels—Massowah, Hansa Line.....	4,361
Barcelona — Syracuse, Hamb'g Am'n Line	5,465
Bastia—Savona, Robt. M. Sloman Jr..	1,527
Bayern—Naples, Hamb'g-Am'n Line....	8,006
Borkum — Massowah, Norddeutscher Lloyd	5,642
Catania—Palermo, Robt. M. Sloman Jr.	2,996
Choising — Massowah, Norddeutscher Loyd	1,657
Christian X — Massowah, Hamb'g-Am'n Line	4,956
Hermersberg — Genoa, Dmpf. Rhed. "Merkur" G.m.b.H (Emil R. Retzlaff)	2,824
Imbros—Girgenti, Deutsche Levante Linie	2,380
Italia—Naples, Deutsche Levante Linie.	3,498
Kattenturm—Syracuse, Hansa Line....	6,018
Konig Albert—Genoa, Norddeutscher Lloyd	10,484
Lemnos—Ancona, Deutsche Levante Linie	2,487
Lipari—Catania, Robt. M. Sloman Jr..	1,539
Marsala—Naples, Robt. M. Sloman Jr..	1,753
Moltke—Genoa, Hamb'g-Am'n Line....	12,335
Mudros — Syracuse, Deutsche-Levante Linie	3,137
Ostmark — Massowah, Hamb'g-Am'n Line	4,400
Persepolis — Massowah, Hamb'g-Am'n Line	4,566
Portofino—Licata, Robt. M. Sloman Jr.	1,754
Prinz Regent Luitpold—Genoa, Norddeutscher Lloyd	6,595
Rhenania—Naples, Hamb'g-Am'n Line..	6,455
Samos—Venice, Deutsche Levante Linie	1,922
Segovia—Massowah, Hamb'g-Am'n Line	4,945
Spitzfels—Cagliari, Hansa Line.....	5,809
Sigmaringen — Syracuse, Norddeutscher Lloyd	5,710
Sturmfels—Massowah, Hansa Line.....	5,660
Terminal—Leghorn, Robt. M. Sloman Jr.	1,523
Tunis—Palermo, Robt. M. Sloman Jr..	1,833
Volos—Venice, Deutsche Levante Linie	1,903
Waltraute — Bari, Rhed. A. G. Oceana (H. H. Schmidt)	3,818
Total, 36 vessels	153,866

Valuable Pamphlet

A pamphlet of much importance and interest to ship owners, ship brokers and ship masters, written by T. Paterson Purdie, president of the Clyde Steamship Owners' Association, on the subject of "Time Charters of British Cargo Steamers," has just made its appearance. The pamphlet contains a series of articles on the subject of time charters contributed by Mr. Purdie to the columns of the Liverpool *Journal of Commerce*.

Purchases Pacific Mail Fleet

THE American International Corporation recently organized with a capital of $50,000,000 to promote foreign trade has purchased the entire remaining fleet of the Pacific Mail Steamship Co., San Francisco. The International Corporation, of which Charles A. Stone is president, is backed by the National City bank, of New York, and numbers among its directorate some of America's most powerful financiers. The price paid for the seven Pacific Mail boats was announced to be $1,250,000. The purchase was made with the co-operation of W. R. Grace & Co., who are to take charge of the management and operation of the line of steamers to Central American ports on the western coast.

Following is President Stone's statement:

"The American International Corporation has purchased the entire remaining fleet of the Pacific Mail Steamship Co., consisting of seven steamships. In this, they have secured the co-operation of W. R. Grace & Co. By this step the last fleet of vessels under the United States flag on the Pacific ocean has been prevented from being broken up.

"It has been known for some time that the Pacific Mail Steamship Co. desired to dispose of all its vessels. Recently it sold to the International Mercantile Marine Co. its four large transpacific steamships — MANCHURIA, MONGOLIA, SIBERIA and KOREA. The remaining vessels, which have just been purchased, were engaged chiefly in the Central American trade. The breaking up of this fleet would have taken from the Central American ports on the west coast all shipping accommodations, and would have practically shut off all trade relations between our Pacific ports and that part of Central America.

Service Was Threatened

"Since the organization of the American International Corporation, appeals have been made to it to take up the situation, especially with a view of saving, if possible, the shipping service between Pacific ports and west coast of Central America. The San Francisco chamber of commerce and the business men of the coast, it was learned, have protested seriously against the breaking up of the fleet.

"In order to maintain the shipping service with Central America, so that trade relations can be continued, this fleet has been acquired and will be kept intact, enabling a continuance of the service for the present.

"W. R. Grace & Co., who have had wide experience in shipping, will manage and direct the operation of the ships. The following vessels constitute the fleet:

"AZTEC, CITY OF PARA, NEWPORT, PENNSYLVANIA, PERU, SAN JOSE and SAN JUAN.

"After the sale of the vessels, the remaining assets of the Pacific Mail Steamship Co. will consist only of the cash paid for the vessels, certain miscellaneous property and current accounts, which it is understood will probably be liquidated as soon as possible."

Grace Buys Pacific Mail Stock

Announcement also has been made by J. P. Grace, president, W. R. Grace & Co., that a deal has been consummated whereby his company will take up the 110,800 shares of the stock of the Pacific Mail Steamship Co., held by the Southern Pacific Co. Grace & Co., under the terms of its offer, which has been accepted, agree to pay to the Southern Pacific Co. the sum of $10 per share for the stock, ex-dividend of $25 per share recently declared by the Pacific Mail Co., and further to pay $2.50 per share additional for the 110,800 shares, on condition that the assets of the liquidating steamship company, exclusive of the seven steamers just sold to the American International Corporation, equal or exceed the sum of $1,250,000.

Under the terms of the agreement by which W. R. Grace & Co. are to take over the 110,800 shares of Pacific Mail stock the minority holders of the steamship company's stock are to be given the same terms of offer, according to them, until Jan. 2, 1916, for acceptance.

Some time ago the International Mercantile Marine Co. paid $5,250,000 for the five of the largest ships of the Pacific Mail's fleet of 12. The Pacific Mail Steamship Co. therefore received a total of $6,500,000 for its fleet of 12 steamers.

With the conclusion of the negotiations mentioned above the Pacific Mail company, which some time ago announced its intention to liquidate, chiefly because of the hardships imposed by the La Follette seamen's act, which is said to have made it unprofitable to operate ships under the American flag, has disposed of practically all of its property. It is said that within a short time the process of liquidation will be completed.

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On the Coasts, Lakes and Rivers

What's Doing and Who's Doing It

Along the Shores of Boston Bay

By George S. Hudson

COAL rates between Chesapeake Bay ports and Boston are the highest since 1874; $3 per ton is being asked and not nearly enough tonnage is available to move the accumulation of fuel. While coal rates are high, the rate on lumber from Maine ports is not in proportion. On the other hand as much as $20 per 1000 is being paid on shipments from Boston to South American ports, about all the lumber originating in Canada and the New England states. A great proportion of the schooners now employed in moving lumber from Nova Scotia and Maine to Boston are of too small tonnage for the coal trade and cannot be pressed into that service much as their owners would like to reap the profits. The average lumber hooker carries 150,000 feet and is too old to risk a dead weight cargo like coal, particularly in the winter season.

* * *

The new steamer PLYMOUTH, owned by the Coastwise Transportation Co., Boston, carried a cargo of 7,500 tons of coal from Curtis Bay to Alexandria and on returning loaded a cargo of 8,646 tons at Norfolk for Boston. She then went to Newport News for bunkers, thence to Curtis Bay where another 7,500-ton cargo was received for Alexandria. Thus this ship during the first few months of her career covers at least one-third of her cost. And the remarkable thing about PLYMOUTH is the fact that she steamed a matter of 12,000 miles with no machinery trouble, despite her being subjected to a prolonged "shake down."

* * *

Satisfactory results have been achieved by the coast guard cutter ANDROSCOGGIN, hospital ship to deep sea fishermen off the coast of Nova Scotia. The cutter will in future make her headquarters at Shelburne, N. S., returning to Boston for supplies once each month. Capt. Van Boskerck commands ANDROSCOGGIN.

* * *

The three-masted schooner HENRY WITHINGTON, laid up at Boston several months, has been overhauled at Green's yard, Chelsea, and will load a cargo of 80,000 cases of oil for Leghorn. She is commanded by Capt. C. E. Acorn.

* * *

A fleet of 20 steamships has been chartered to transport 50,000 horses from Boston to England and the continent within a period of three months. The horses originate in Canada and the west, reaching Boston by the Grand Trunk and Boston & Maine railroads. A corral has been erected at Mystic wharf, Boston, where the horses are being quarantined. Nearly all ships engaging as horse-carriers are freighters equipped with temporary stalls accommodating 1,000 to 1,200 animals.

* * *

The fishing schooner CONQUEROR, Capt. Griffin, was hove down off Cape Ann in a recent blizzard, going over so far that the cover on the cook's range caromed against the under side of the deck. When the vessel righted, her mainboom, foregaff and jumbo club were broken and most of the dories had been washed off the deck.

* * *

The three-masted schooner SAMUEL B. HUBBARD, abandoned while bound from Ingramport, N. S., for New York with a cargo of lumber, has been sold at a Boston wharf and sailed for Windsor, N. S., in command of Capt. Kerr.

* * *

Capt. Ernest Trinick, son of the late Capt. John Trinick of the Furness line steamship MILANESE in the London-Boston service, is commander of the British steamship CATERINO, which recently arrived at Boston from Fowey, Cornwall, with a cargo of china clay.

* * *

The lake-built steamer LANSING which C. W. Morse brought to the coast several years ago, has been laid up for an overhauling at Green's yard, Chelsea. The vessel is reported as having touched bottom while on passage from Perth Amboy for Lynn.

* * *

The Union Sulphur Co. has purchased the steamship PACIFIC built last year by the Emery Steamship Co., of Boston, now liquidated. The price paid was not far from $700,000. The ship's name will be changed to HEWITT. Another ship owned by the Emery Steamship Co., ATLANTIC, has been sold at an advantageous figure.

* * *

A new three-masted schooner, GEORGE S. SMITH, built by F. S. Bowker & Son, at Phippsburg, Me., for Rogers & Webb of Boston, has been placed in the southern lumber trade.

* * *

Bertlessen & Petersen, East Boston, have received contract to place new boilers in the excursion steamer DOROTHY BRADFORD, plying between Boston and Provincetown. About $27,000 is involved.

* * *

Owing to heavy accumulation of freight at Boston, the Metropolitan line has been running daily trips between that port and New York.

* * *

Repairs to the steamer NACOOCHEE of the Savannah line, made necessary by a fire that broke out in the forward hold, were made at the Atlantic Works, East Boston, new deck beams and woodwork being involved. The ship was out of commission about ten days.

* * *

A full cargo of grain, first to be shipped from Boston for England in a long time, went out in the British steamship HELMSDALE, recently. The ship had 184,000 bushels of wheat and cleared for Swansea.

* * *

The steamer GOV. COBB of the Eastern Steamship Corporation, recently landed in Boston 4,000,000 sardines for transshipment to England. The fish were brought from Eastport and Lubec, Me., the steamer making a special trip for that purpose. The sardines were to order of the British government.

* * *

The American bark RUTH STARK has loaded a cargo of rum at Boston and sailed for Africa. STARK not long ago arrived from England where she delivered a cargo of lumber.

* * *

The steel tug MEXPET, an oil burner owned by the Mexican Petroleum Co., arrived at Boston the other day and attracted considerable attention. The vessel is 116 feet long and consumes 1,968 gallons of crude oil for each 24 hours steaming. MEXPET is commanded by Capt. W. A. Rex and carries a crew of 12.

In New York Harbor

By George Nicholson

IN THE month of November there arrived in New York 430 steamers, five ships, five barks, 31 schooners, a total of 471 vessels of 1,191,222 tons from foreign ports, and 244 steamers and 137 schooners, a total of 381 vessels from coastwise ports, making a grand total of 852 vessels. This is at the rate of nearly 29 vessels per day. This is a gain of over 104 ships and 277,500 tons over November, 1914.

* * *

The recent gale which swept over the entire Atlantic coast was considered by many authorities the worst that has been experienced in years, scores of vessels, barges, etc., being sunk or damaged. Big ships were long delayed on their voyages; the wind at times attained a velocity of 90 miles an hour. The American liner NEW YORK arrived two days over due. The Russian steamer SOUCHAN, which arrived in New York after the storm with cargo booms, bridge and boat platforms

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damaged. The Norwegian bark VALERIE, from Buenos Ayres, lost lifeboats.

* * *

The steamer ANTILLA, of the New York and Cuba Mail Steamship Co., Ward Line, while outward bound for Cuba collided with a tug towing a string of barges outside the Narrows, and as a result a big hole was smashed in her port bow. She had to be beached on the Sea Gate shore of Gravesend bay. With the assistance of numerous tugs she was finally towed to a dry dock.

* * *

The schooner C. H. BROWN, formerly of Perth Amboy, built in 1889, has been sold to Captain Theodore Krum.

* * *

James W. Elwell & Co., of New York, have acquired by purchase the steamer ESKASONI, British, 1,682 tons, IBERIA, British, 2,061 tons, and LASSELL, 1,225 tons.

* * *

The Atlantic Transport liner MANCHURIA, formerly one of the Pacific Mail steamers, and now under the British flag, was recently in New York harbor from London on her maiden voyage under her new owners.

* * *

The barge GIBSON, which went ashore on the Five Fathom Bank off the New Jersey coast loaded with 3,000 tons of coal, is a total wreck and has broken up. A hard fight was made by the coast guard cutter SENECA and wrecking tugs to save her. It is said GIBSON was drawing 27 feet of water when she struck on a four fathom spot.

* * *

STOCKHOLM, the first vessel to be placed in service by the newly-formed Swedish-American Line, has arrived in New York on her maiden voyage under her new owners. The vessel was formerly the Holland-American liner POTSDAM, and was purchased for a large sum of money, and an additional $135,000 was expended in overhauling her. This vessel marks the beginning of a great maritime project on the part of the Swedish-American Line, in which the Swedish government is interested.

* * *

Two steamers of the Pacific Alaska Steamship Co.'s fleet are now undergoing extensive repairs at one of the yards in Erie Basin, Brooklyn, at a cost of $100,000 for each vessel. The steamers are ADMIRAL SEEBREE and ADMIRAL CLARKE. The vessels are being completely overhauled, fitted with new steel masts, new stern frames and the pilot houses are being shifted from the forecastle head to the after part of the vessels. The ports are being plated and steel cargo booms installed capable of lifting 20 ton weights. When finished the vessels will be equipped with all the latest cargo handling gear and the work is expected to be completed early this year. Until the Panama canal is reopened, the vessels will probably make one or two trips from New York to the West Indies in the sugar trade, but they will ultimately be employed in the cargo trade from Puget Sound ports to Alaska or from Puget Sound ports to San Francisco, for which purpose they were originally purchased

* * *

The first of four oil-carrying steamers which are being built by the Fore River Shipbuilding Corporation, Quincy, Mass., has been launched.

Around the Golden Gate

By A. A. Willoughby

THE demand for carriers on the Pacific coast has been so brisk that charters are being made for trips as late as the fall of 1916. This situation is almost unprecedented in the annals of Pacific coast shipping. The demand continues largely for lumber carriers to Australia. Windjammers are receiving a measure of popularity again and charter rates to Australia range from 85 to 100 shillings. A number of the boats have done little off shore duty for a number of years. Fully a score of boats will leave for Antipodean ports during the coming spring and summer.

* * *

The wrecking steamer GREENWOOD was nearly the victim of an accident recently. A 60-ton steel safe which was being loaded from the GREENWOOD to the Norwegian freighter THOR, fell through the deck when the lashings gave way and crashed through to the hull. The damage was but nominal.

* * *

The United Engineering Works, Oakland, has contracted to build a freighter for C. Henry Smith, Inc., San Francisco. The vessel is to be 340 feet long, 48 feet beam and 27 feet molded depth; it will be fitted up to burn either coal or fuel oil.

* * *

The largest cargo of wool that ever came through the Golden Gate arrived on the W. R. Grace boat AZTEC early in December; it contained 13,821 bales. The wool was transshipped to two trains of 48 freight cars for special shipment to eastern mills. AZTEC, Capt. Stewart, was 30 days making the run from Brisbane.

* * *

The bark PRINCE VALDEMAR which was partly dismantled in a storm and has been lying in Mexican waters for some years, was recently brought to port in tow of the tug HERCULES. The bark has been purchased by Geo. W. McNear, Inc., and will be given a thorough overhauling, including new spars and an auxiliary engine. She will go into off shore service.

* * *

A. M. Garland, formerly traffic manager of the Pacific Mail, has been appointed assistant to the president and general manager of the new China Mail S. S. Co., operating the steamship CHINA. H. N. Thomas, formerly general passenger agent of the Pacific Mail, will act in a like capacity with the new company.

* * *

MANILA, formerly the flagship of the Spanish navy in Pacific waters, captured by the United States at Manila bay, has been sold by the Union Iron Works into whose ownership it passed from private shippers, to the Pacific Engineering Co., San Francisco.

* * *

The steamers THOS. L. WAND and SAGINAW have been purchased by J. H. Baxter & Co. These are the first steamers to be used by this company, which has been a large operator of windjammers.

* * *

The Grace liner SANTA CECILIA which arrived at port early in December, was the first of the steamers which had been diverted to the Magellan route on account of the canal slides to reach San Francisco. The SANTA CECILIA was followed by four of the American-Hawaiian freighters, ARIZONA, NEVADA, IOWAN and COLUMBIAN.

* * *

The schooner HENRY K. HALL, owned by Geo. E. Billings & Co., has been chartered to carry a cargo of lumber to South Africa at the record-breaking price of 142 shillings, 6 pence. The schooner has a carrying capacity of 1,500,000 board feet.

* * *

The steamers VALDEZ and JUNEAU which are on their way to the Golden Gate from Philadelphia, under charter to the Quaker Line, will hereafter be operated on the Pacific coast. They were formerly in service on the Great Lakes.

* * *

A. F. Thane & Co. have ordered an auxiliary schooner for the lumber carrying trade. The schooner will be a five master, of steel construction and will cost in the neighborhood of $250,000.

* * *

The announcement of the sale of the ship MANGA REVA by C. A. Thayer & Co. to eastern buyers for a reported price of $130,000, brings to light some interesting facts. The ship cost $110,000 to construct some 20 years ago, and during that time has earned her original cost many times. She was formerly known as PYRENEES, but following her being wrecked on Manga Reva reef in the South Pacific, she was renamed after being repaired in 1901.

Delaware River Notes

By Dr. C. S. Street

THE British steamship CHEVIOT RANGE reports a severe storm and the loss of Captain James Fell. She crept into the Delaware Dec. 29. Her bridge was completely wrecked and her boats gone. She is now at Girard Point undergoing repairs. Her cargo is china clay. Richard Piper has been given charge of the vessel. He was first mate under Captain Fell.

* * *

Captain H. B. Thompson of the American steamship PETROLITE, owned by the Standard Oil Co., arrived at Marcus Hook Dec. 30. He reports an attack on his vessel by an Austrian submarine. He lowered a boat and went alongside the submarine and was ordered to procure some food, which was refused, as Captain Thompson explained he had only enough for his own wants. Captain Thompson would not discuss the matter further.

* * *

On New Years day there was a fleet of 35 steamers in Philadelphia loading and discharging cargoes. There were a number of vessels lying at anchor waiting their turn to load for outgoing voyages. In addition to the steamships, there were fifteen sailing vessels. Five of them were square riggers and the balance schooners.

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Chesapeake Bay Doings

By Hollis F. Bennett

THE American schooner WALTHAM, outward bound for Cienfuegos, Cuba, with coal, after being aground for 14 days on Sharp's island in the lower Chesapeake bay, was hauled off by the Coast Guard Cutter APACHE after part of the cargo had been lightered. WALTHAM was brought to Baltimore for docking and survey and later continued her voyage.

* * *

The Baltimore Maritime Club has been organized among shipping men of the Oyster port. Capt. W. H. Jamieson, a widely known stevedore, is president; Dr. F. C. Bayne, vice-president, and H. T. Anderson, secretary-treasurer. The club has meeting rooms at Kelly's hotel, Gay and Water streets.

* * *

Captain James F. Butler of the big six-masted, Portland schooner EDWARD B. WINSLOW, loading coal for Rio de Janeiro, is accompanied by his wife, who has been the captain's companion for the last thirty years on his voyages. During that time Mrs. Butler has become a skilful navigator. WINSLOW'S freight from Baltimore to Rio approximates $42,250.

* * *

The Spedden Ship Building Co., Baltimore, has been awarded a contract to build a steel tug boat hull for the Eastern Transportation Co. The hull will be 125 feet long, 24 feet beam and 14 feet molded depth. It is probable that the engine and boiler of the tug SEA KING will be placed in the new hull. The same company is making extensive repairs to the United States quartermaster's tug RENO, stationed at Fortress Monroe, Old Point Comfort, Va.

* * *

The United States coast guard cutter WINDOM has finished a complete overhauling at the service station in Arundel Cove. In keeping with the Department's practice of naming the cutters after Indian tribes, WINDOM'S name has been changed to COMMANCHE.

* * *

Captain John Moreno, who has been in command of the war department's dredge CHINOOK on the west coast, has arrived to take command of the new dredge SAN PABLO, building at the yards of the Baltimore Dry Docks & Shipbuilding Co. CHINOOK is the largest dredge operated by the war department and was formerly the army transport GRANT.

* * *

The new steamship MUNAMAR, built by the Maryland Steel Co., at Sparrow's Point, for the Munson Lines' Cuban service, was dry docked at the lower plant of the Baltimore Dry Docks & Ship Building Co. and left for Norfolk on Dec. 17. MUNMAR loaded coal at Norfolk to bring her down to her load draught and left for New York on her official trial trip. On this trip she exceeded her contract speed of 13½ knots loaded. She was designed by Theodore D. Ferris, naval architect, New York City.

* * *

The Baltimore schooner RICHARD CROMWELL, inbound, was run into and waterlogged by the Spanish steamer MAR CANTABRICO on Dec. 19, also inbound from Seville. CROMWELL was later raised and towed to Baltimore for repairs. CROMWELL was one of the fleet of fast fruiters which a decade or more ago, before the advent of the steam fruiter, plied between Baltimore and the West Indies.

* * *

The Maryland Steel Co. has delivered the steamship FLORIDIAN to the American-Hawaiian Steamship Co. FLORIDIAN replaces WASHINGTON, sunk off the Capes of the Delaware river after collision with the schooner ELIZABETH PALMER. The steamship CLARE has also been delivered to her owners, A. H. Bull & Co., by the Maryland Steel Co. The CLARE is a sister shop to EDITH recently built for the same owners. She is 328 feet long, 46 feet beam and 25 feet 6 inches deep. Captain J. R. Risk, late of the steamer RUTH, will command the new vessel. CLARE sailed on Dec. 28 for Sewells Point to load coal for Portland, Me.

* * *

Captain W. H. Fox, of the British steamer SHADEWELL, arriving in Baltimore on Dec. 27 from Havre, was fined $5,000 by Collector Ryan for failing to procure proper bill of health. Captain Knox was notified to leave Havre under convoy at a stated time by the government and could not obtain his papers from the American consul before departure. Captain Knox has appealed his case to the proper authorities in Washington.

* * *

The Baltimore Dry Docks & Shipbuilding Co. has been awarded a contract for converting the motorship CALGARY from a bulk cargo carrier to an oil tanker. Four cylindrical oil tanks will be installed in the vessel in accordance with designs furnished by Charles P. M. Jack, naval architect, New York City. CALGARY is 248 feet long, 42 feet 6 inches beam and 19 feet molded depth. She was and 19 feet molded depth. She was built by Swan, Hunter & Wigham Richardson Ltd., Newcastle-on-Tyne, England.

Around Puget Sound

By F. K. Haskell

BEGINNING in February, the rate for carrying flour from North Pacific ports to the Orient will be advanced to $12 a ton. For some time the tariff has been $8 a ton. The new quotation, it is said, will prove prohibitive. It will be the record freight rate in the history of transpacific shipping.

* * *

Seafaring men are known for their resourcefulness, but Capt. Mike Meagher, master of the power schooner PROGRESS, who with the aid of fishermen dug a dry dock in the sandy beach four miles south of Yakutat, Alaska, built a cradle for his vessel with timbers cut in the woods, and taking her out of the water completed repairs extensive enough to make the craft seaworthy and able to continue her voyage, is declared to be in a class by himself. PROGRESS sailed from Ketchikan Nov. 5. Shortly after leaving the former port heavy weather set in and the vessel anchored; in spite of the efforts of the crew to safeguard her she drifted until she struck on a rocky ledge, which necessitated the repairs.

* * *

It is a long stretch from Ireland to Portland, Ore., yet three ships have reached the latter port from Emerald Isle during the past month, the last being the Russian bark PORT CALEDONIA, 147 days from Dublin. The French bark CORNIL BART arrived Dec. 4 from Dublin and she was 150 days covering the distance, while the French bark PIERRE ANTONINE reported Dec. 9 from Belfast after a run of 153 days. The situation is such these days, with high freights available from the west coast and the war curtailing movement of general cargo from the other side, that the three vessels were dispatched without a pound of cargo, being in ballast.

* * *

In an effort to prevent a repetition of the CARELMAPU disaster, the Canadian government is planning to establish a chain of life saving stations from Barkley sound, where the Banfield power lifeboat is stationed, to Quatsino sound and along the shores of the Queen Charlotte islands. Northwest shipping men are greatly interested in these plans to maintain additional life-saving stations and a life saving tug on the west coast of Vancouver island. There is great danger of American vessels as well as those of other flags losing their way off Cape Flattery in foggy weather or being driven on the Vancouver island shore.

* * *

The Canadian Pacific steamers commandered last year by the British government have now been released and will resume their schedules in a short time. Practically the entire fleet was requisitioned for government service in various capacities. Besides MONTEAGLE and EMPRESS OF JAPAN, there will be placed on the Vancouver-Orient run EMPRESS OF RUSSIA and EMPRESS OF ASIA. MONTEAGLE has been on her old run for some time, while EMPRESS OF JAPAN arrived at Vancouver a short time ago from the Orient. EMPRESS OF RUSSIA and EMPRESS OF ASIA are at the present time refitting at Hongkong to resume their service on the Vancouver-Japan-China schedule.

The Great Lakes

The passenger steamer CITY OF TOLEDO will be lengthened 40 feet amidships during the winter, and will receive five new Scotch boilers. The work will be done by the Detroit Ship Building Co., at a cost of approximately $100,000, and is expected to be completed by June 1, 1916. The alterations will add one-third to the steamer's passenger and freight carrying capacity.

* * *

Repairs have been completed on the steamer WALDO, wrecked in the storm of November, 1913. She was given new boilers in addition to a large number of new plates.

* * *

Captain James Porter, who sailed the Great Lakes for 40 years, died recently at his home in Lorain, O. He was 83 years old.

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Red Hot Tips From the Trade

Pertinent Suggestions and Personal Gossip

L. W. FERDINAND & CO., 152 Kneeland street, Boston, Mass., have issued a circular containing directions for melting marine glue and paying deck seams. The circular states that when the glue is all melted the temperature is about equivalent to the boiling point of water. The glue, however, is too thick to run freely and if used in this state, trouble will be encountered from air bubbles. Therefore, it should be boiled and stirred for a few minutes after it reaches the melting point and should be used at a temperature of from 250 to 300 degrees Fahr.

When applying marine glue to decks, the oakum should be laid well down in the seam and packed hard, leaving the seam ¾-inch deep after caulking. The seams should be payed after caulking. Water, cold naphtha or kerosene should be used for dipping the caulking irons, as linseed oil or grease prevents the glue from adhering to the edges of the planks. In paying decks, the glue should be poured from the ladle into the seams, holding the nose of the ladle an inch from the deck.

The circular states that 14 pounds of Jeffery's marine yacht glue will run from 200 to 250 feet of seam ¾-inch in depth and ¼-inch in width. If properly used and not overheated, it is claimed it will last from four to six years and that it will not stick to the feet in hot weather.

Raymond Releasing Gear

An interesting releasing gear for launching life boats is being marketed by James R. Raymond, Maritime building, New York. This device has been before the shipping public for several years and the manufacturer reports that owing to the revival in ship building throughout the country, sales are showing a considerable increase. The Raymond hook is designed to disengage the life boat from the falls safely and positively, regardless of the state of the sea at the time of launching. It is a well known fact that a large number of boats are wrecked through being smashed against the side of the ship after they reach the water, and this danger can be avoided to a great extent if the boat is quickly disengaged from the falls. With the ordinary type of gear, several moments may elapse before a life boat is released, at a time when every second is of vital importance. At present the law requires the installation of safety releasing hooks on all American vessels carrying passengers. The law does not require cargo vessels to be so equipped, but progressive owners of freight steamers realize the value of safety devices of this character for their vessels.

New Dry Dock for New York

The largest sectional floating dry dock in the country is to be built at the foot of Fifty-eighth street, Brooklyn, New York City, by the Morse Drydock & Repair Co. It is said the dock will have a lifting capacity of 27,000 tons, which will exceed that of any other floating dock in the United States by 12,000 tons. The new dreadnought NEVADA can be berthed within it, and the VATERLAND and IMPERATOR of the Hamburg-American line and the MAURETANIA of the Cunard Line.

According to the plans, which are under inspection by the department of docks and ferries, New York City, the big floating dry dock will be capable of lifting and lowering ships so rapidly that four vessels can be placed within the dock in 24 hours. It is expected that a ship can be lifted in 20 minutes and floated in seven.

In connection with this improvement, preliminary work is under way for the construction by the company of shops and an office building, facing the waterfront, with entrance to the dock yards at Fifty-sixth street. It will be three stories high and will be built of concrete and brick. It will include part of the inclosure where the old Bergen mansion is situated. This will be retained and removed to another point in the yards and fitted up as a recreation house for the workmen.

Test Big Dry Dock

The new dry dock and ship-repair plant at Prince Rupert, B. C., Canada, is now in operation. It was built by the Grand Trunk Pacific railway, and was projected by the late Charles M. Hays.

The completed plant consists of a 20,000-ton floating dry dock, the second largest on this continent; carpenter shop; shipbuilding shed and launching platform; machine shop; boiler and blacksmith shop, and foundry. There is also a concrete power house, with boilers of 2,400 horsepower, and two 1,000-kilowatt turbo-generators, together with an air compressor having a capacity of 1,500 cubic feet per minute.

The floating dry dock is made up of three parts, which will fit together in any combination. By a special link-and-pin device, any pontoon is easily removable for examination or repair.

A steel derrick, capable of lifting 50 tons, is installed for the purpose of handling heavy lifts into and out of ships, and is used as well for handling heavy commercial freight for the railway. Traveling cranes are installed in all the shops as well as in the power house.

Raising Eastland

The Great Lakes Towing Co., Cleveland, has issued an attractive folder illustrated with original photographs showing the operations in connection with raising the steamer EASTLAND in the Chicago river in July, 1915. A number of hitherto unpublished views are presented, together with complete details regarding the wrecking steamer FAVORITE and the 800-ton pontoon used by the Great Lakes Towing Co. on this job. The details of the salving of EASTLAND were presented in the October, 1915, issue of *The Marine Review*, pages 378-381.

Rinek Booklet

The Rinek Cordage Co., Easton, Pa., manufacturer of manila rope, has issued an exceedingly attractive booklet entitled "Used the World Over". This booklet details the method of manufacturing Rinek rope in an interesting manner and also contains data covering tensile tests of ¾-inch and 1-inch manila rope which were made at Lafayette College, Easton, Pa. Complete tables of weight and strength also are included.

The Sprague Electric Works, New York, describes its enameled conduit in a 4-page booklet recently issued. Illustrations, specifications and a general description of the conduit are presented.

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Equipment Used Afloat and Ashore

Anchor Windlass—Ship Yard Cranes

THE accompanying illustration shows a steam-driven anchor windlass built by the Dake Engine Co., Grand Haven, Mich. This windlass is provided with a top capstan, which is geared for two speeds, giving two different pulling capacities. To change from fast to slow speed it is simply necessary to reverse the throttle. The capstan will then rotate in the same direction, but at one-third the former speed, with a corresponding increase in strain on the cable. The design of the apparatus is compact and care has been taken to provide parts of ample size to avoid breakage. The windlass is built in three sizes with 10, 15 and 20-horsepower engines, respectively. The largest size requires a floor space of only 43 x 72 inches.

Large Ship Yard Cranes

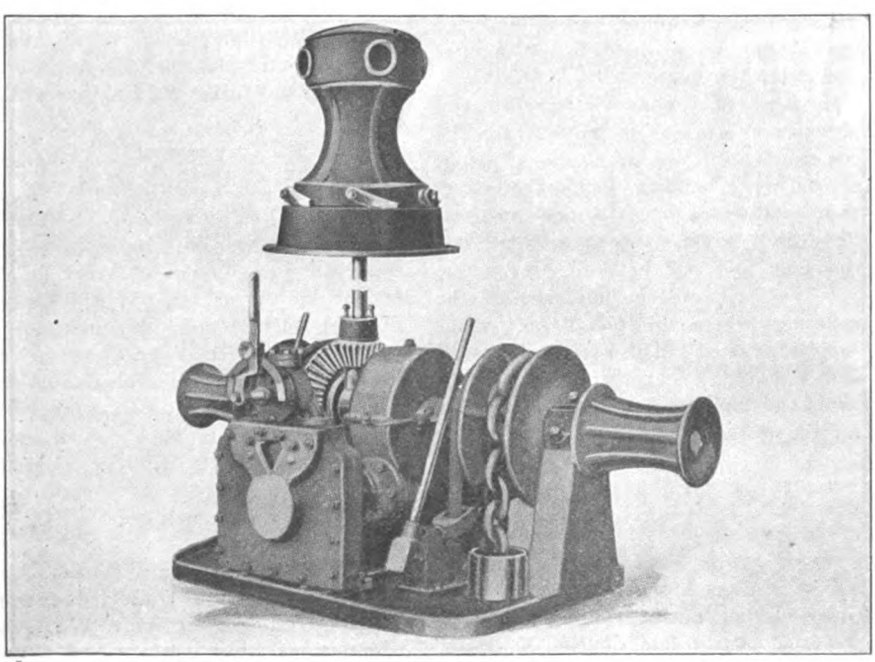
Six large electrically operated traveling tower jib cranes, shown in the accompanying illustration, are now being erected at the ship yard of the Maryland Steel Co., Sparrows Point, Md. They were designed and built by the Alliance Machine Co., Alliance, O.

Four of these cranes have a capacity of 12½ tons and two of 15 tons. The height of each crane from the track on which it travels to the top of the tower is 125 feet. Each crane has a maximum working radius of 60 feet. These cranes are operated by electric motors on 220-volt direct current, and are carried on eight large track wheels mounted in equalizing trucks.

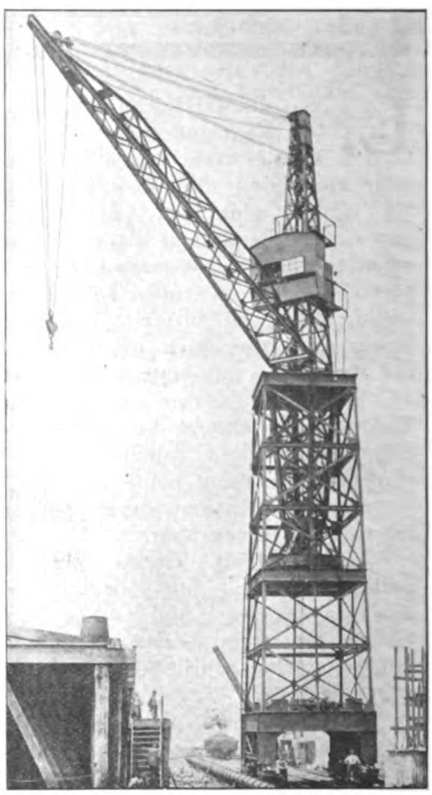
The longitudinal travel along the shipway is accomplished by two complete lines of gearing, each operated by a motor; each crane has a double drive with individual motors. These cranes are provided with two hoists, 15-tons and 3-tons capacity, respectively; the latter are designed for lifting loads up to three tons at 150 feet per minute, and each crane is so constructed that the jib can swing 360 degrees.

The length and adjustable feature of the jib makes it possible for each crane to serve the full side of one-half of each of the two vessels between which it operates. In other words, the reach extends beyond the center of the vessel. It will be noted from the illustration that the cranes are constructed so that a locomotive can pass through the archway forming the base, making it possible to get the materials used in the construction of vessels past the first crane and into the radius of the second of each pair.

The towers are strongly braced and an ample factor of safety has been allowed. The operator is provided with a cab in which he is protected from the weather.



STEAM ANCHOR WINDLASS WITH TOP CAPSTAN



REVOLVING SHIP CRANE

Raising F-4

The Broderick & Bascom Rope Co., St. Louis, Mo., has issued a reprint of an exceedingly interesting article which recently appeared in *The Yellow Strand*, describing the operations connected with raising the wrecked United States Submarine F4 in Honolulu harbor. For a week the submerged vessel was held by a single 2½-inch manila center wire rope manufactured at the Broderick & Bascom factory. The rope was not new when requisitioned by the government for salving the F4. In fact, it had already done heavy duty for three years on construction work for the Hilo Railway Co. on the island of Hawaii near Honolulu.

During the year recently closed 10,279 vessels arrived at the port of New York. This is an increase of 1,076 vessels as compared with the year 1914. American ships showed an increase in arrivals of 654, British 282, Dutch 146 and Norwegian 108. German arrivals decreased 348, Austrian 49 and Cuban 39.

The battleship TEXAS has been donated a solid silver model of an ancient warship standing 4 feet high, by the Holland-American line.

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Has many advantages over ordinary wire and fibre ropes in marine work.

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Let us give you some performance records and other information about Fibreclad Wire Rope —or any of our other products, including Standard Wire Rope, Manila Rope, Armored Rope

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Acknowledged after years of service to be the most economical and consistently serviceable rope in the marine field.

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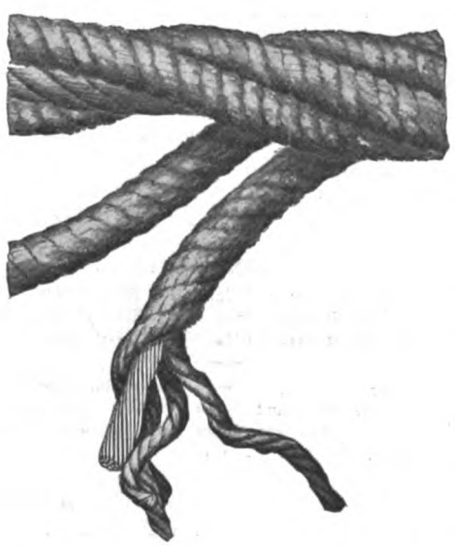

Satisfied users heartily recommend it and their experience justifies your adopting it for *coal hoist, boat falls, slings* and in Hawser Construction for *spring lines* and *emergency tow lines.*

We solicit your inquiries and patronage.

DURABLE WIRE ROPE CO.

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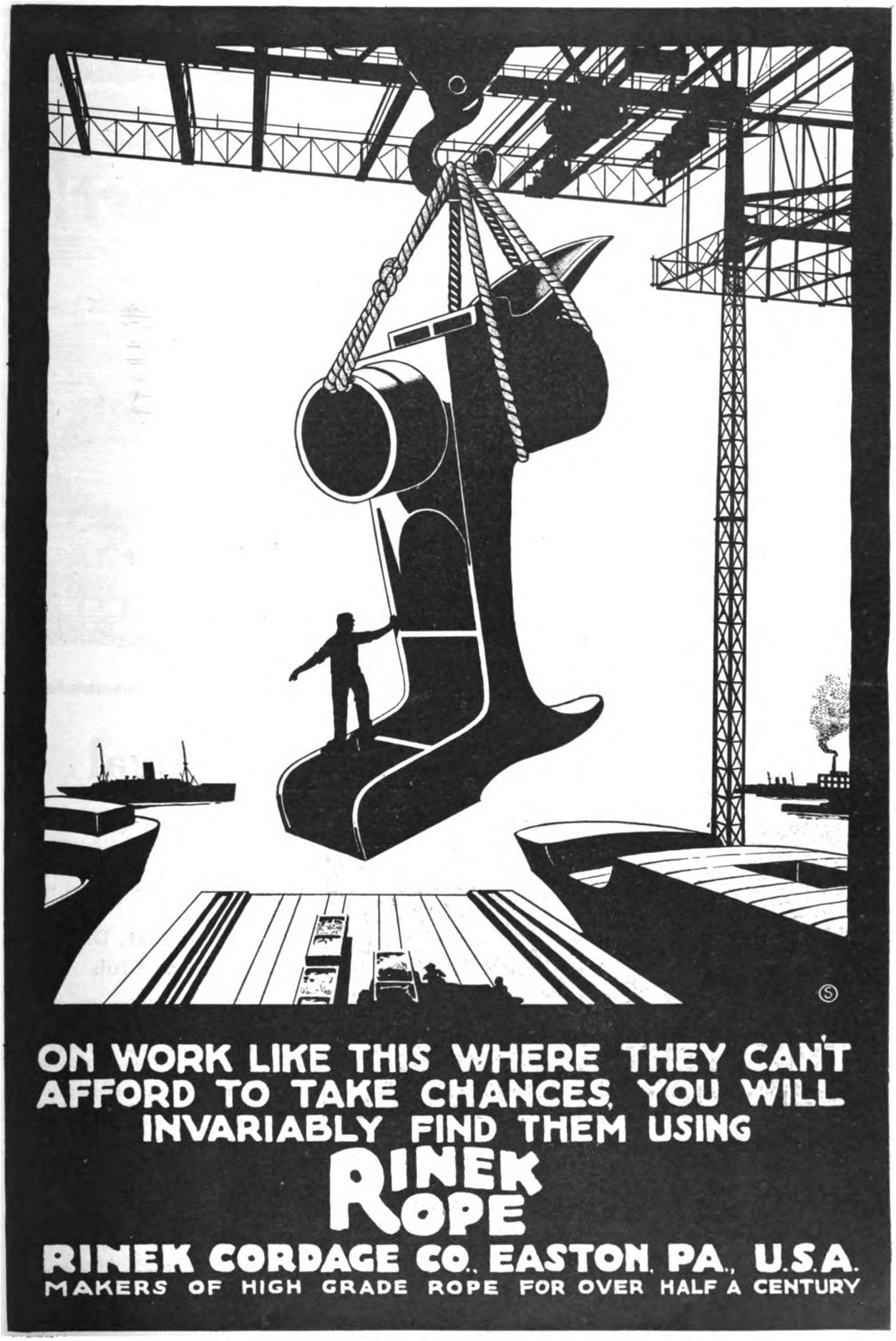
ON WORK LIKE THIS WHERE THEY CAN'T
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INVARIABLY FIND THEM USING
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MAKERS OF HIGH GRADE ROPE FOR OVER HALF A CENTURY

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IT will outlast any steel rope of the same size and rated capacity, and is exceedingly flexible. Its unusual elasticity insures great recuperative ability—the quality that causes it to return to its natural condition after withstanding abnormal load strains.

AN ENVIABLE RECORD

¶ Altho it was one of the first cables attached, "YELLOW STRAND" alone held the "F-4" FOR ONE WHOLE WEEK after all others had broken. Moreover, this was not a new cable, for it had already experienced severe service since 1912, in the erection of ten steel bridges. No wonder then that this cable, known throughout the Islands as "Old Hilo", has become known as "Old Faithful", among the tug crews of Honolulu Harbor. The complete story of the wonderful demonstration of this YELLOW STRAND rope is given in a booklet which we will be glad to send you on request.

Broderick & Bascom Rope Co.

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Factories: ST. LOUIS, SEATTLE

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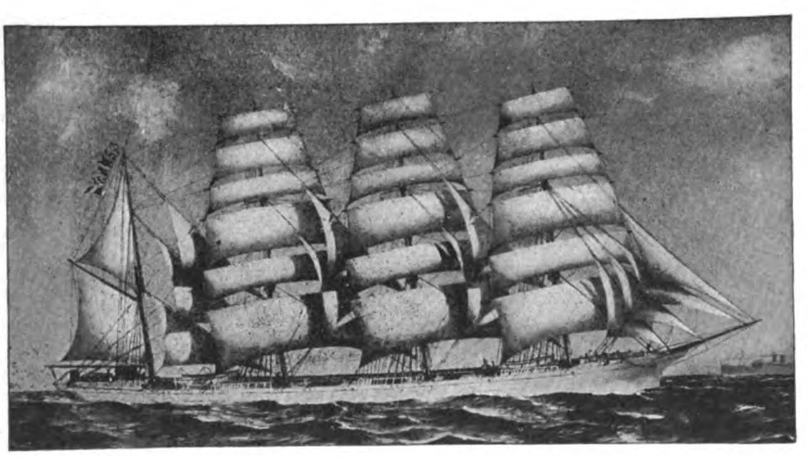

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For your Boat, Den, Office or Club

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It will be well worth your while just to see this truly beautiful masterpiece. Detail and realism is its keynote. Everything that is of interest is shown both on deck and aloft. You'll be proud to own a copy.

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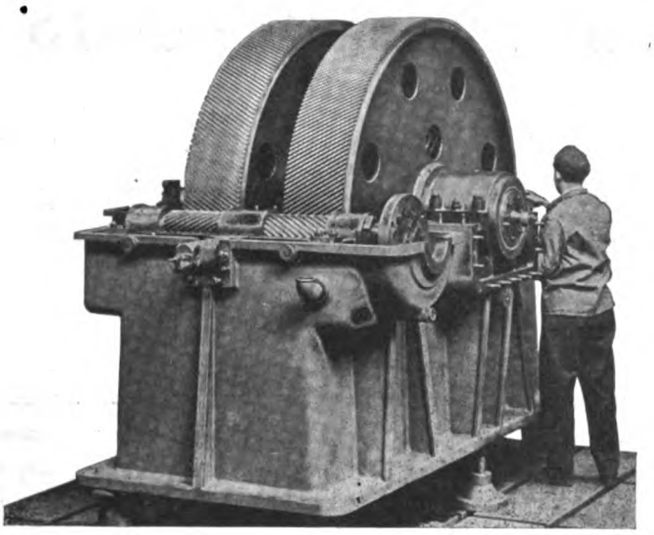

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We Have in Successful Operation over 100,000 H. P. in High Power Gears

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Burn Continuously From Eighty to Three Hundred and Sixty-five Days and Can be Seen a Distance of Six Miles

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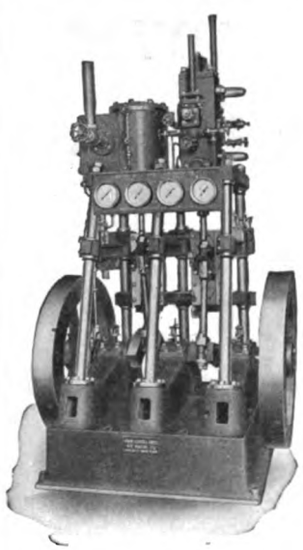

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Main Office: 472 W. Erie St., Chicago, Ill.
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121 South Third St., Minneapolis
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41 King St. East, Toronto
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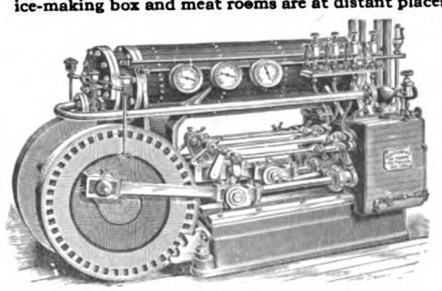
The Allen Dense-Air Ice Machine

contains no chemicals. It is placed in the engine room, while the ice-making box and meat rooms are at distant places of the steamer.



Over two hundred in daily service in the tropics on men-of-war, steam yachts and mercantile steamers.

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It is of great interest for all manufacturers to send regularly their "Catalogues" to "Le Mois Scientifique et Industriel" from where they will be forwarded to every one interested in the line.

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The Ship Builder in Peace and War

THE past year played havoc with many good old fancies. Take naval battles, for instance. Our schoolbooks gave us a mental picture of warships crowded together amid thick white smoke, with officers waving swords on a craft about to sink, while down in the lower left hand corner was a shattered spar all but submerged with its burden of drowning sailors.

We know better now. A modern naval action is fought with the opponents miles apart. The fleet with the fastest ships and the biggest guns wins. The actions at Heligoland Bight and the Falklands were settled, not on the high seas, but in the drafting rooms and shipyards of two rival ocean powers.

The United States is destined to be a maritime nation. We cannot escape our destiny. In peace or in war, the battles that must be fought for commercial or territorial supremacy or for the maintenance of our principles of government, will be waged on the oceans. And in peace as in war, the vital need will be ships, more and more ships.

It will not do for us to depend, even in part, on the purchase of foreign-built tonnage. In order to assume our rightful place among the great maritime powers of the earth, we must encourage and aid our own ship yards. Business sense and patriotism alike demand that the money we spend on new vessels be kept at home, to strengthen the hands of those who, of all great commercial enterprises, are the most directly interested in the nation's maritime development—the ship builders. These men have never hesitated or wavered in their faith. In spite of public indifference and adverse legislation, they have continuously improved their equipment and increased the capacity of their yards until at present no competitors in the world can rival them in rapidity of work and quality of product. On the pages immediately following, ***The Marine Review*** *presents the announcements of a group of representative American ship yards—plants that are now playing an important part in the revival of the country's merchant marine.*

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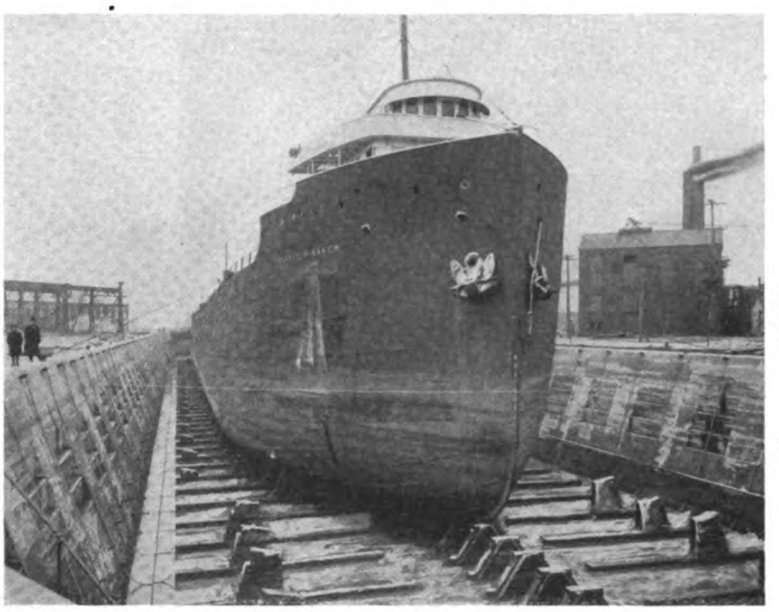
Chicago Ship Building Company

CHICAGO, ILLINOIS

We Build
Steel Ships

Passenger
or
Freight

Any Size



Steamer George F. Baker in Our New Concrete Dock at South Chicago

Dimensions of Dry Dock

	Feet
Length -	734
Width:	
At Top -	103
At Bottom -	88
Depth -	22½

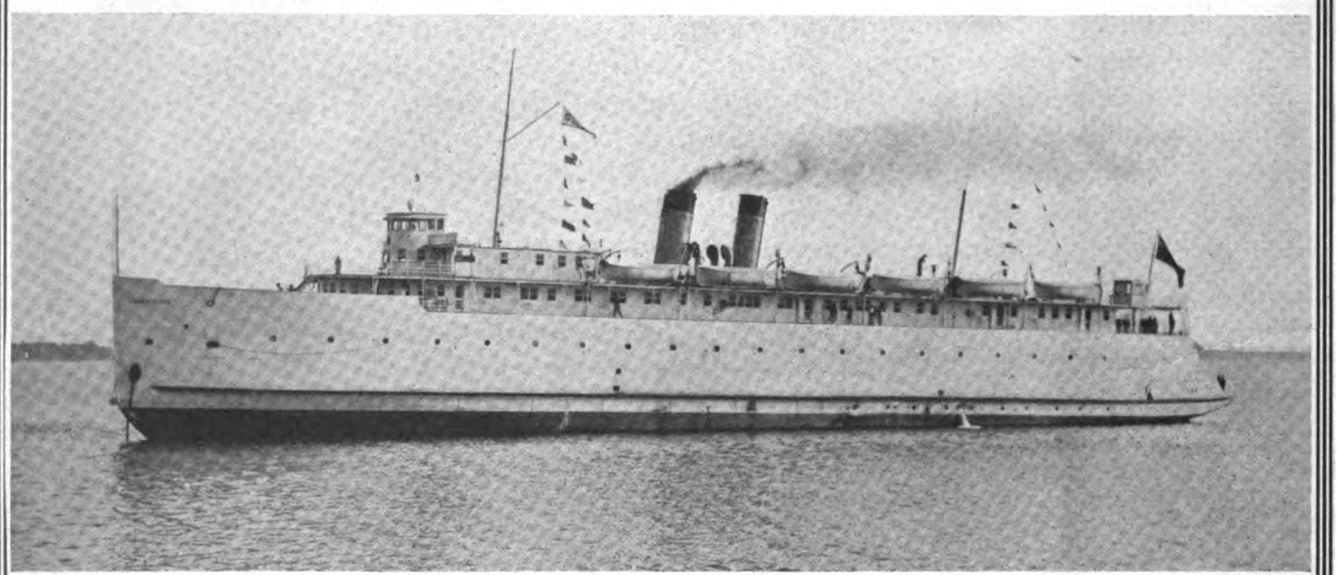
We Operate the Largest Graving Dock on Lake Michigan
Complete Facilities for Rapid Repair Work

Shops and Dry Dock at South Chicago

POLSON IRON WORKS, LIMITED

TORONTO, CANADA

Steel Shipbuilders - - - Engineers and Boilermakers



Car Ferry "Ontario No. 2"—Length 318', Breadth 54', Depth Moulded 20' 6". Twin Screw, 4500 H.P. Capacity, 30 Loaded Cars and 1000 Passengers
Largest Steamer Afloat on Lake Ontario built by "Polson Coy." 1915

Steel Vessels, Tugs, Barges, Dredges and Scows
Marine Engines and Boilers, All Sizes and Kinds

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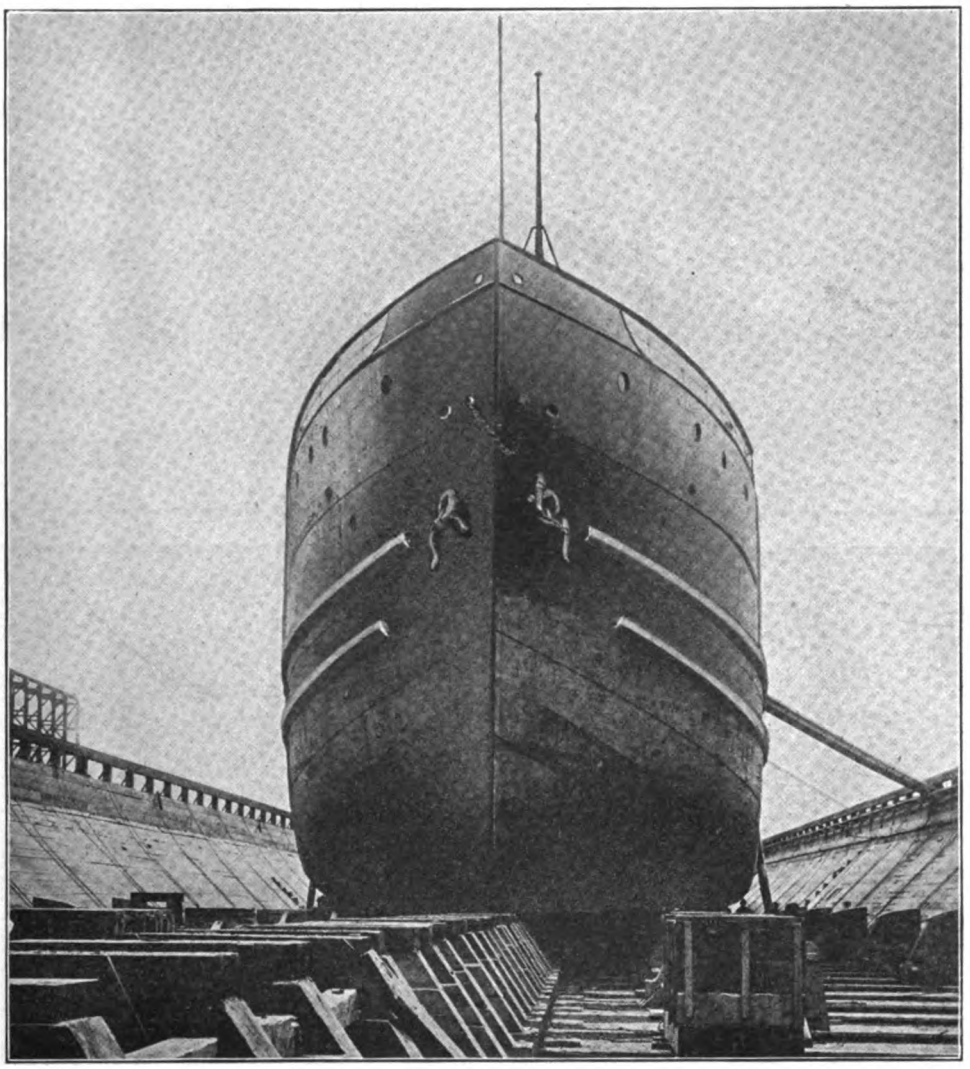

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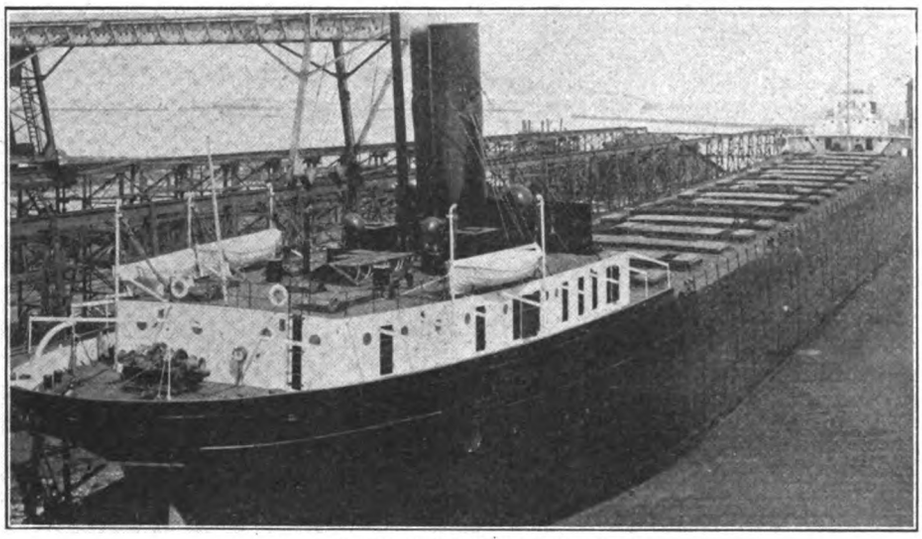
LIMITED

COLLINGWOOD—ONTARIO—CANADA

STEEL and WOODEN SHIPS, ENGINES, BOILERS, CASTINGS and FORGINGS

PLANT FITTED WITH MODERN APPLIANCES FOR QUICK WORK



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DRY DOCKS and SHOPS

EQUIPPED TO OPERATE

DAY or NIGHT on REPAIRS

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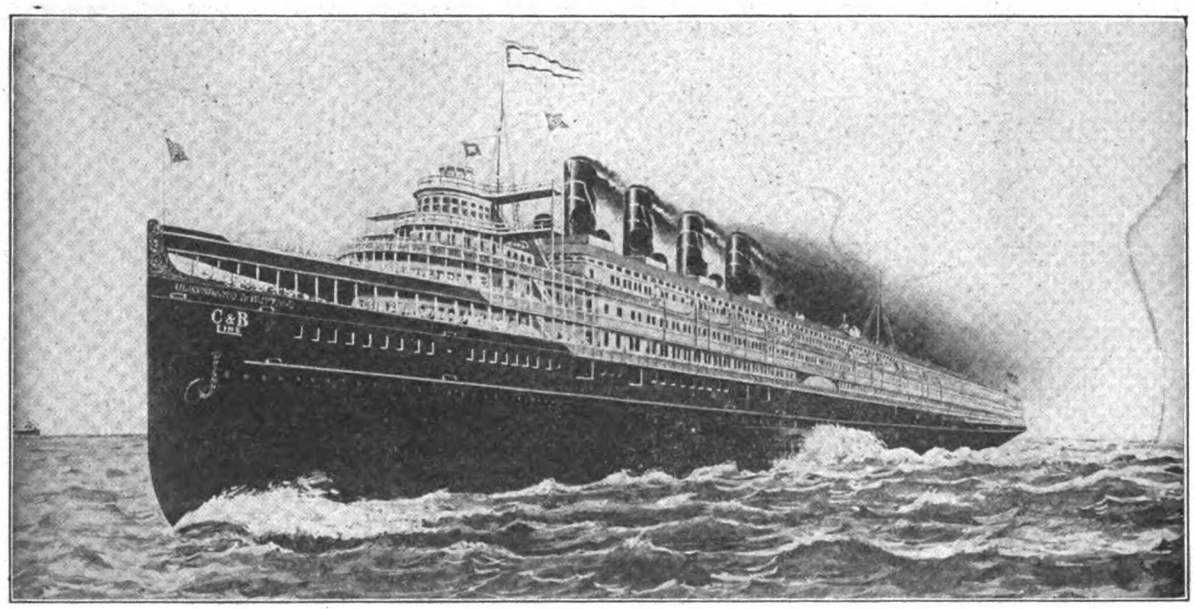
DETROIT SHIPBUILDING COMPANY

Established 1852



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Designers and builders of all types of

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Manufacturers of BRASS MARINE HARDWARE and BRASS SPECIALTIES.
Builders of **Metallic Life Boats** and **Clark Patent Metallic Life Rafts.**

Steel Shipbuilding Plant at Wyandotte, Michigan.
First-class equipment for making hull and machinery repairs.

Dry Docks, Machinery Works and General Offices, foot of Orleans Street, **DETROIT, MICH.**

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The American Ship Building Company

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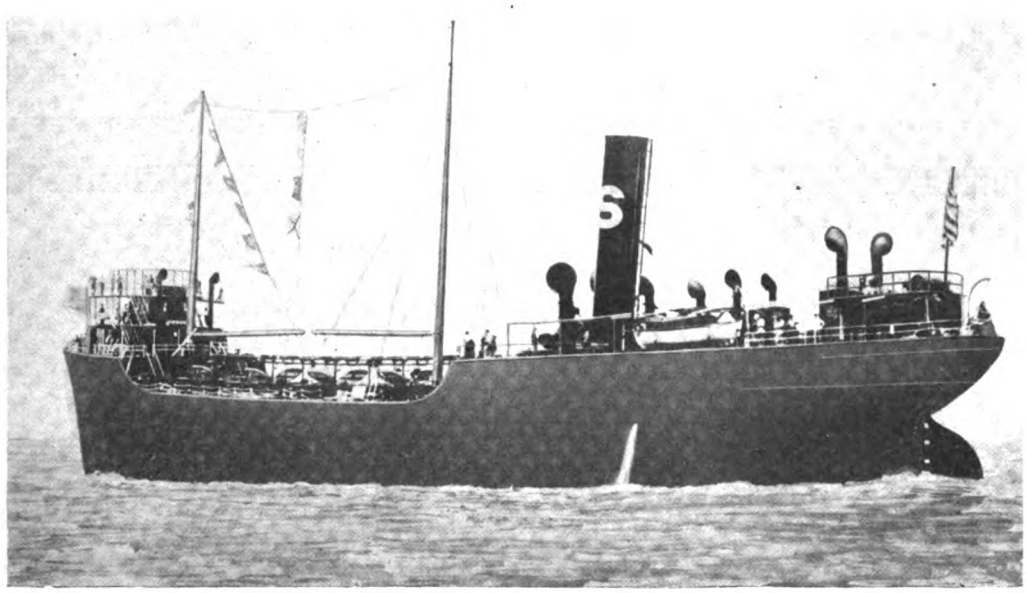

Oil Steamer COMET Built for Ocean Service by the American Ship Building Co.

¶ Special Facilities for the Construction of Ocean Going Steel Steamers, coupled with extensive experience assures satisfactory results on salt water work.

We Operate Fast Dry Docks and Complete Plants at Cleveland and Lorain

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THE SUPERIOR SHIP BUILDING CO.

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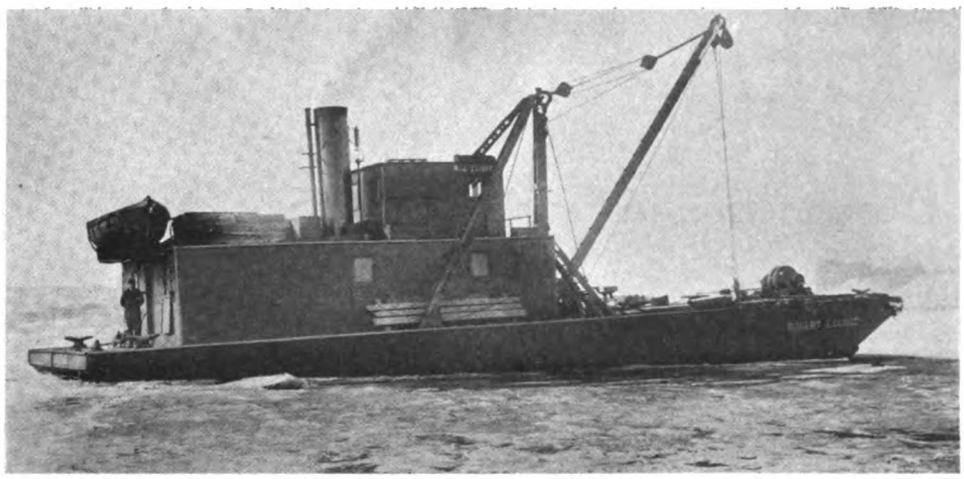
MARINE REPAIRS—Hull, Boiler, Engine

2---DRYDOCKS---2



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EQUIPPED WITH

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Air Compressors
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Electric Lathes
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Ten Ton Derrick

Boiler Repairs—Our Specialty

Modern Marine Boilers

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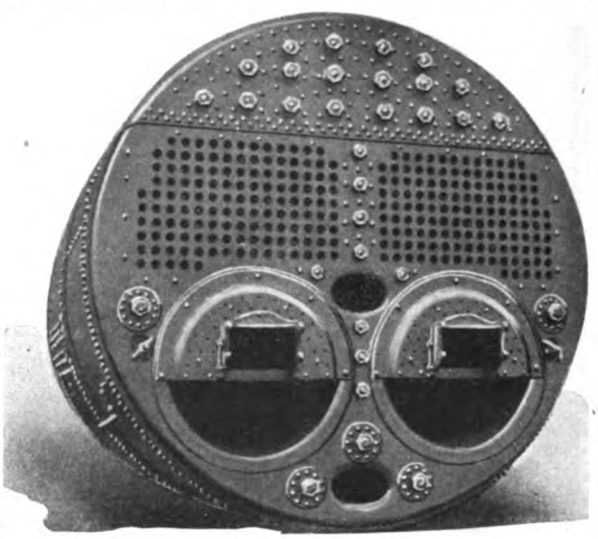

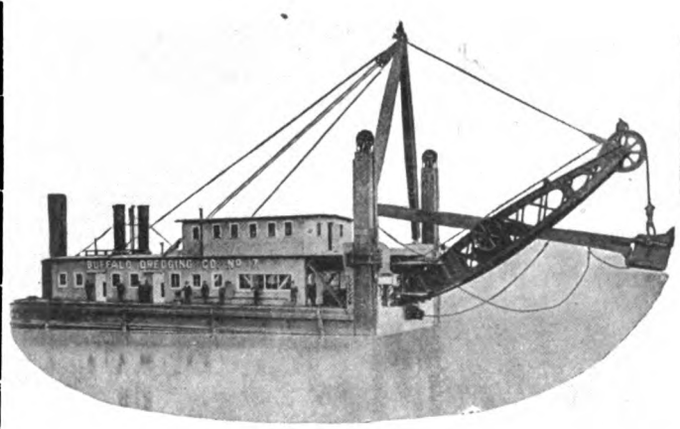

Tugs, Passenger Steamers and Special Construction

JOHNSTON BROTHERS, FERRYSBURG, MICHIGAN

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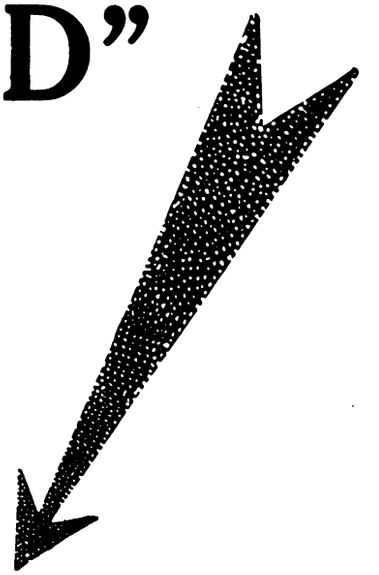
"ISHERWOOD"

SYSTEM

OF

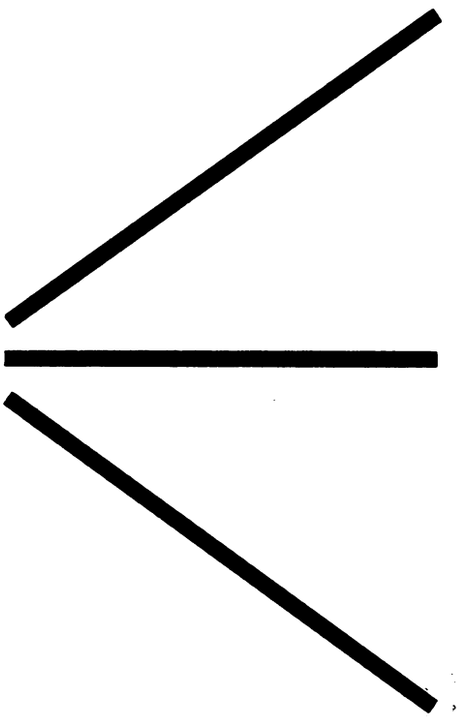
SHIP BUILDING



Experience has proved that this system gives increased strength, increased cubic and deadweight capacity, reduced cost of maintenance, and reduced vibration at no greater first cost than a vessel of similar dimensions built on the transverse system.

Owners who are contemplating the construction of new vessels, of any type whatever, will find this system of construction most advantageous and suitable for all trades.

446 vessels of all types and sizes, representing about 3,335,800 tons deadweight, have been built or are now on order, including a good many repeat orders from Owners who have tried the system.



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LONDON, E. C.

Tel. Address:
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Milwaukee, Wisconsin

Ship Repairs of All Kinds

Also Machine Shop for Engine Repairs

We have two ship yards offering every facility for the repair of both steel and wooden vessels. South Yard Dock is 450 feet long on keel blocks; 460 feet over all; 60 feet width of gate and 16 feet over sill. West Yard Dock is 312 feet on keel blocks; 45 feet width of gate and 12 feet over sill. Rudder pit in each dock. Electric light for night work.

Residence Phone
F. W. Smith, Manager
Lake 467

Main Office at South Yard
Foot of Washington Street

Telephone—Hanover 3
West Yard—Hanover 2555

Tietjen & Lang Dry Dock Co.

HOBOKEN, N. J.

NINE DRY DOCKS

600, 800, 1,000, 1,200, 1,400, 1,800, 2,000,
6,000, 10,000 TONS

General Repairs on Wooden and Iron Vessels

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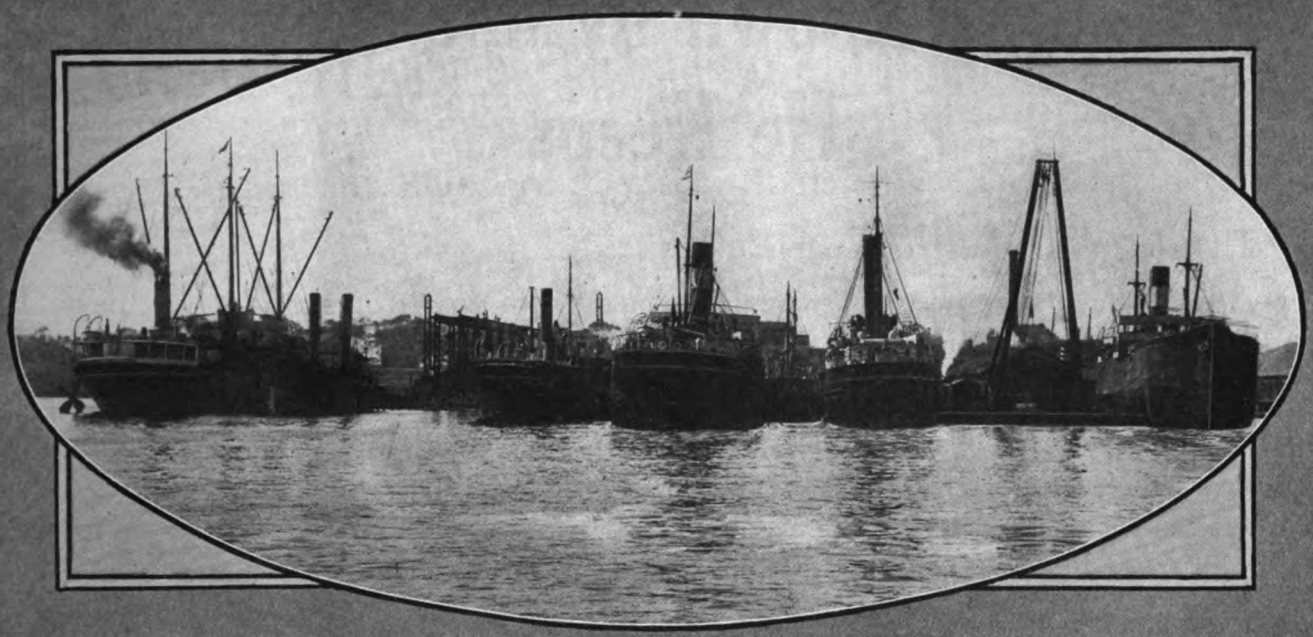

Our Dry Docks SAVE TIME

THE LESS TIME your boats hang around dry docks the better. But the buffets of winter seas make frequent repairs a necessity and when you do have to lay up, a fast yard can easily save you hundreds of dollars. At "Baltodocks" you find repair work done with speed, precision and economy. We have two big graving docks and marine railways, backed up by extensive shops and a live-wire organization. Let us show what we mean by ***SERVICE.***

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BALTIMORE, MD.

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J. M. WILLIS, Assistant Gen'l Mgr.

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The same thing is true of a publication.

Advertisements not only advertise the commodity or service offered for sale—they advertise the character and the standing of the medium itself.

You would not need to see the reading matter in the *Saturday Evening Post,* for instance, in order to know that it maintains a high standard of excellence in its field. Nor would you have to read the articles in one of those journals whose publishers send it unasked for a year and then try to make you pay for it; in order to surmise *its* real character.

A Publication is Known by the Advertisers Who Use Its Columns

Man cannot live by bread alone. Nor can a publisher prosper by the mere revenues he derives from subscriptions and advertising. He stands or falls by the character of those who consider his publication a worthy medium for furthering their business.

Foremost among the broad-gaged, far-sighted business men who are today placing the United States in its rightful place as a great maritime power, are ship builders and dry dock operators. The esteem and faith of such men mean far more to a publication than the mere cash value of their support.

No less than nineteen of America's greatest ship builders and dry dock operators scattered all over the country have chosen ***The Marine Review*** to bring their message to the shipping world in this special issue. Their advertisements appear in the accompanying pages.

The Character of The Marine Review's Advertisers is a Just Measure of The Marine Review's Standing in the American Maritime Field

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Completely Equipped Shops for Ship, Engine and Boiler

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Ship Builders, Engine Builders, Boiler Makers, Iron Founders, Brass Founders, Lumber Manufacturers

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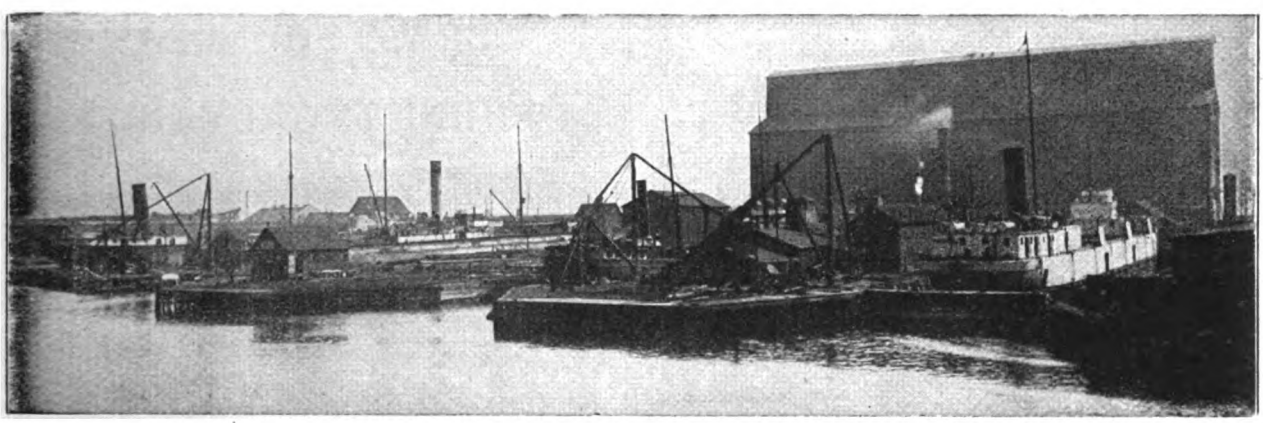
SEATTLE, WASHINGTON



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BUFFALO, N. Y.

With our excellent equipment we are enabled to do all kinds of ship repairs at reasonable cost to the owners, whose patronage is solicited with the guarantee of satisfaction in all particulars.

We call attention to our facilities for the construction of new vessels of all kinds, particularly dredging outfits, tugs, scows, fuel lighters, etc., plans for which we will furnish on application together with specifications and estimates of cost.

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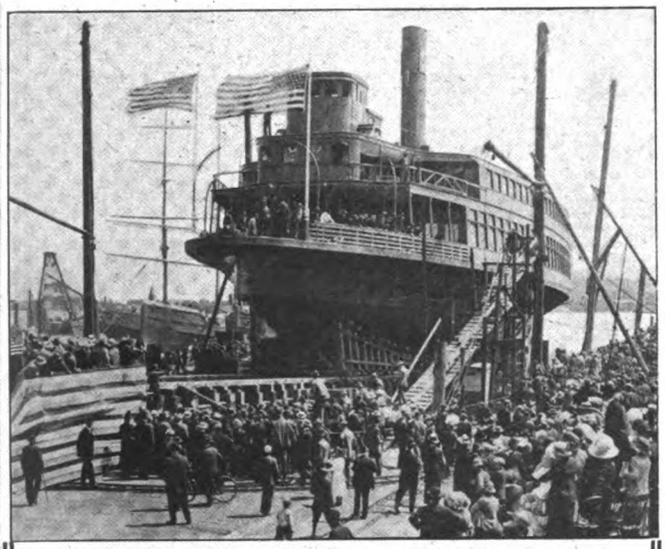

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Fully equipped for repairs to Wood and Steel boats.

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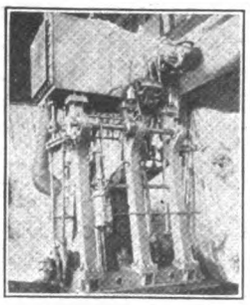

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ENGINES
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MANITOWOC, WIS.

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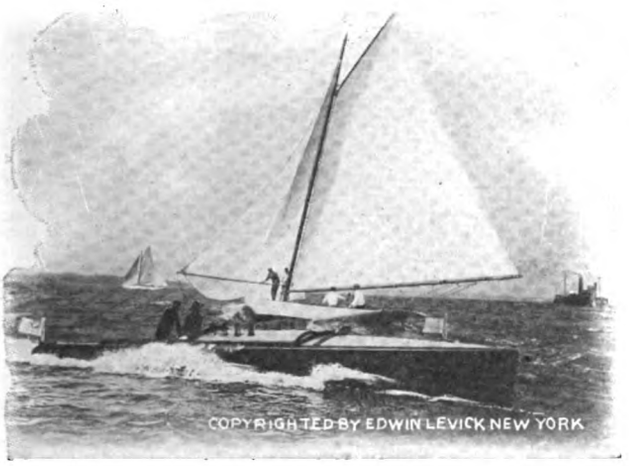

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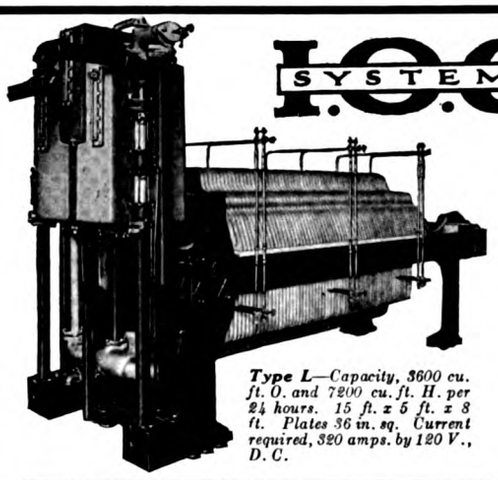

Type L—Capacity, 3600 cu. ft. O. and 7200 cu. ft. H. per 24 hours. 15 ft. x 5 ft. x 8 ft. Plates 36 in. sq. Current required, 320 amps. by 120 V., D. C.

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This I. O. C. Generator is equal in productive capacity to 50 unit cells, and requires only one-sixth the floor space.

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Single Plate with Asbestos Diaphragm

Its adoption means the utilization of smaller space, elimination of cylinder storage and waste connected therewith, an ever-ready source of supply of oxygen and hydrogen of the highest efficiency, at low operating cost, and at a negligible maintenance cost.

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Our method of Electric Welding enables us in a **few hours** to do work which by other methods would take **weeks.**

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We have plenty of water at our dock for boats of any size.

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Write us at once

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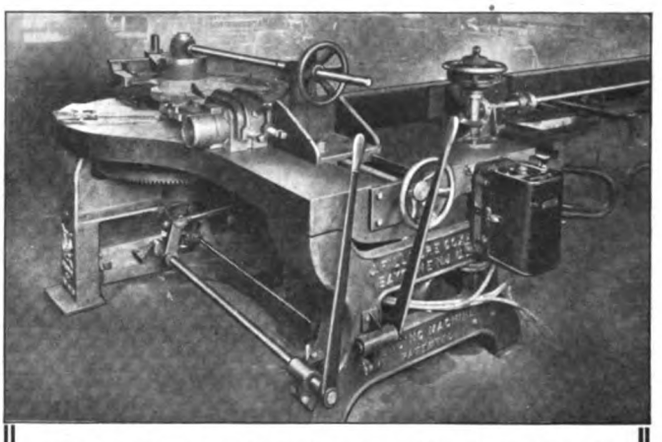

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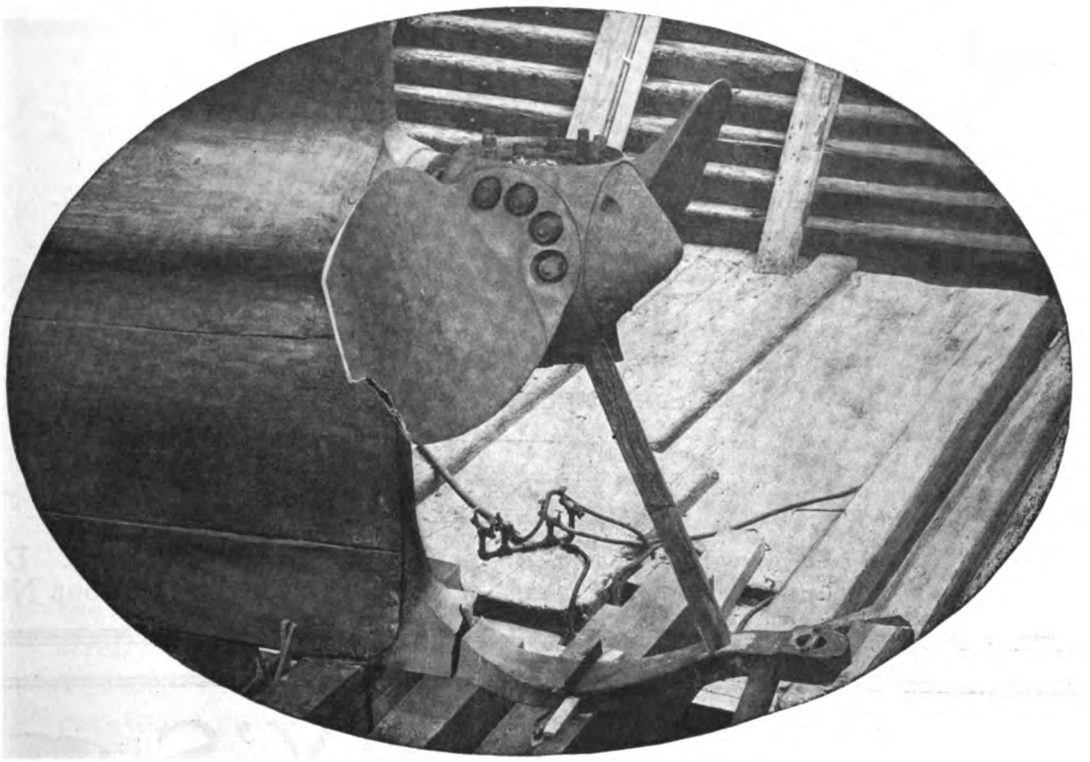
Wire Our Nearest Office and the Repair Will be Executed Without Delay



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¶ In order that the Goldschmidt Thermit Company may be in a position to estimate on the cost of any welding operation a blue print or sketch should be submitted giving full dimensions of the sections to be welded and showing the exact location of the fracture.

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¶ The Thermit Process was sanctioned for Marine Repairs after exhaustive tests by the British Corporation for the Registry and Survey of Shipping, Glasgow.

¶ Many repairs made by the Thermit Process are illustrated and described in our pamphlet No. 3440. A copy will interest you.

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For Deck and Hull Seams of Yachts and Motor Boats

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Specified by all first-class designers, and used exclusively by all the prominent builders.

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It is ready for use and requires no heating; simply open the can and paint it on, like ready-mixed paint.

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It is a Johnnie-on-the-Spot article that no boat man should be without.

Sent by mail on receipt of 30 cents in stamps.

For Ships' Decks Use { **No. 2, First Quality Ship Glue** / **No. 3, Special Navy Glue**

All put in 1, 2, 3 and 5-lb. cans; also 14, 28, 56, 112-lb. boxes, either tin or wood.

Insist on having the RIGHT kind if you hope to obtain Satisfactory Results.
The largest dealer in your town carries this in stock; if not, he should. Tell him to write us for the agency.

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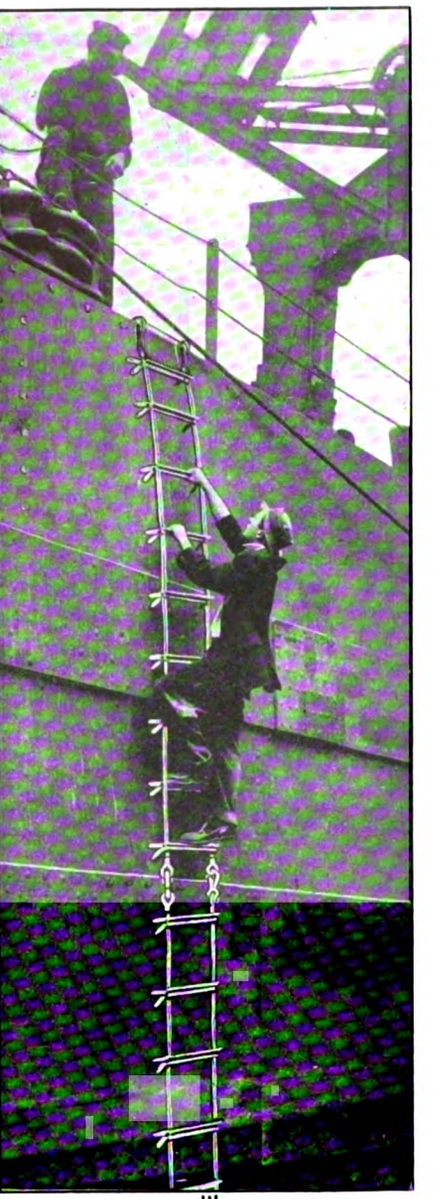
McArthur Jacob's Ladder



This ladder, altho very compact when rolled for storage, is always ready for immediate service. It is absolutely safe and exceptionally convenient. It is made in sections of any desired length, which can be instantly connected by means of snap hooks, thus making it adaptable to light or loaded condition of ships, and eliminating the telescopic feature of the former type.

The cable used in the manufacture of the McArthur Jacob's Ladder is of plow steel, which combines lightness and strength. The steps are of sherardized iron, and have two tooth prongs giving a firm foothold. The hooks are of steel, and all rivets are copper.

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"I used your Jacob's Ladder all of the season of 1913 and have no fault to find with it. We did not have an accident of any kind while using it, and consider it the best thing for the purpose of landing men on the dock, that I know of today."—Charles A. Benham, Master of Steamer John Stanton.

"I find the McArthur Portable Jacob's Ladder one of the most useful ladders on a ship for getting men ashore on dock and manning boats."—Edward Fitch, Master Steamer Utley.

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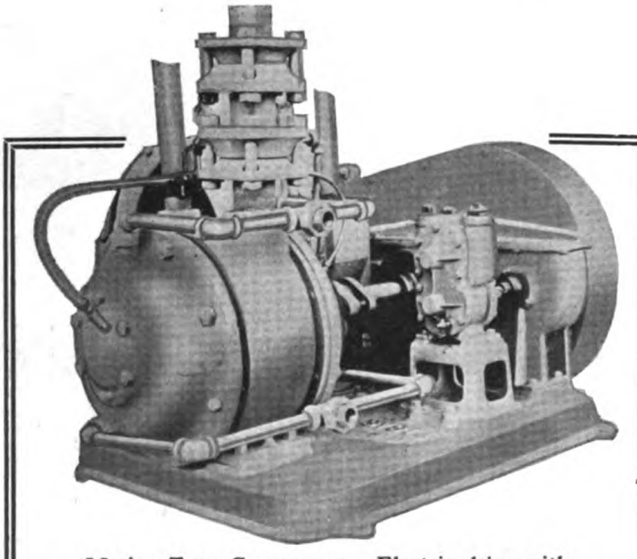

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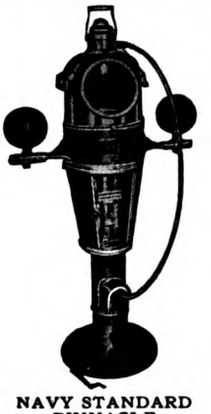

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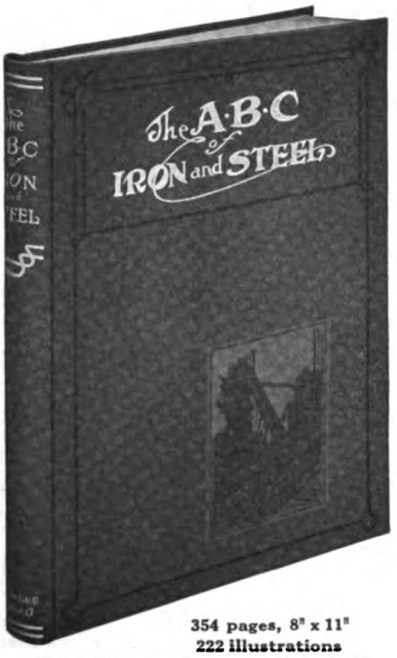

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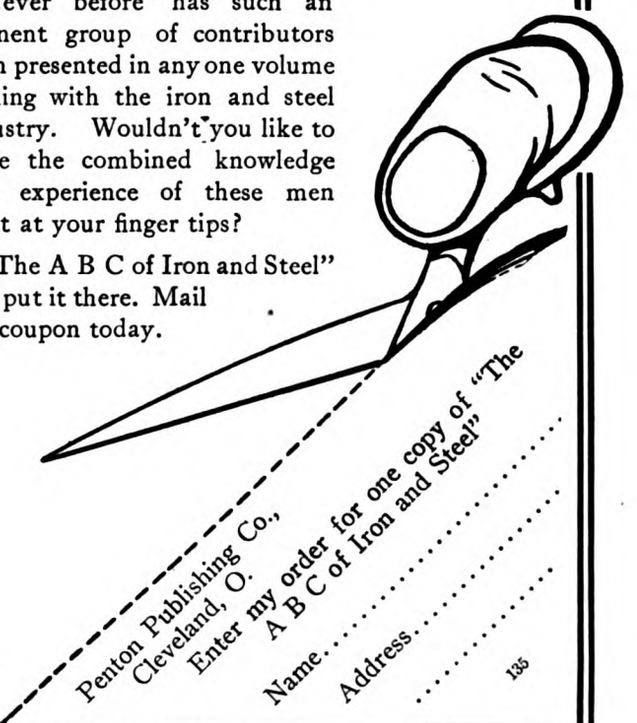

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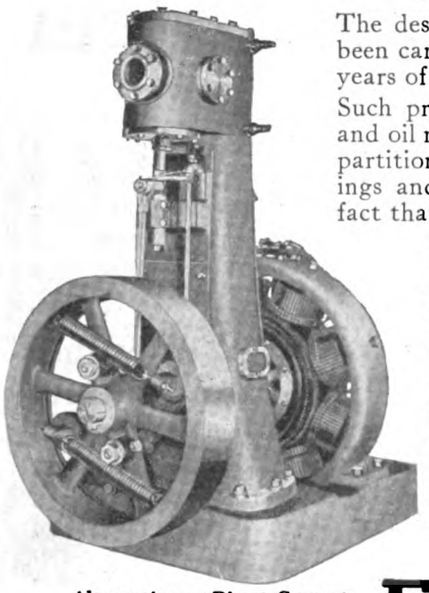
DIRECT CONNECTED
Dynamos and Engines



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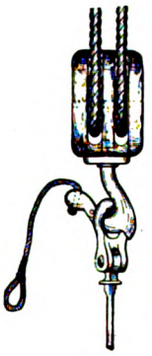
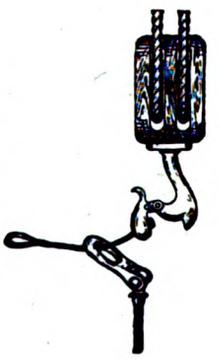
Stand by to Lower

THE RAYMOND RELEASING DEVICE is exclusively used in the United States Navy and the United States Coast Guard Service, to whom reference is unhesitatingly given. It is also used on 75% of the ocean passenger carrying vessels coming under the supervision of the United States Steamboat Inspection Service. Its ***Simplicity*** of ***Construction*** and ***reliable automatic action*** is what commends it to those having a practical knowledge of such matters, and is the reason for its extensive use. It possesses features found in no other device for the purpose intended, and therefore is without an equal.





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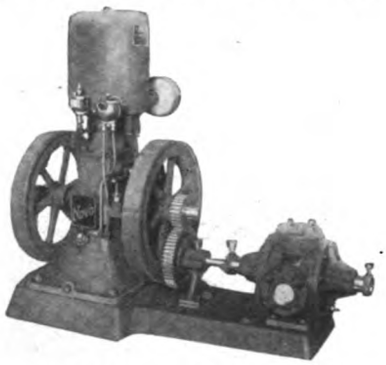
Can You Beat This With Your Bilge Pump?



By using Blackmer you have a pump for fighting fire and washing decks as well as bilge work.

We specialize in Bilge pumps and guarantee them to please you.

They are not an experiment as they have been in actual use for now upwards of nine years.

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is the **Economical** kind of sheet packing. It is the **"cheapest per year"** sold, because it gives you the most service for your money.

"N. B. O." is unequaled as a joint packing, not only on steam lines, but also on **ammonia, gas, oil** and **alkali.**

We'll be glad to send you a sample piece large enough for you to give it a satisfactory trial.

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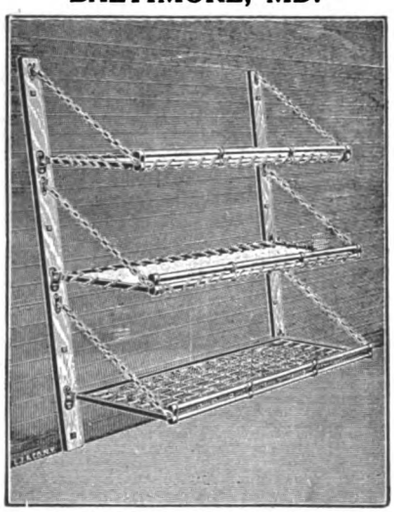

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"I have much pleasure in stating that your Cherub Log has been in constant service for a period of over four years, and has given no trouble whatever. It has during that period registered some 190,000 miles and I have no doubt this is the finest Log in the market at the present time."

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THIS SERVICE stands for more than the marketing of products that pertain to your work. It reaches further than the mere selling of merchandise. ¶ With every J-M product you buy there is an obligation on our part to make good—a complete responsibility for its performance. ¶ This is what makes Johns-Manville Service a complete satisfaction to those who use it.

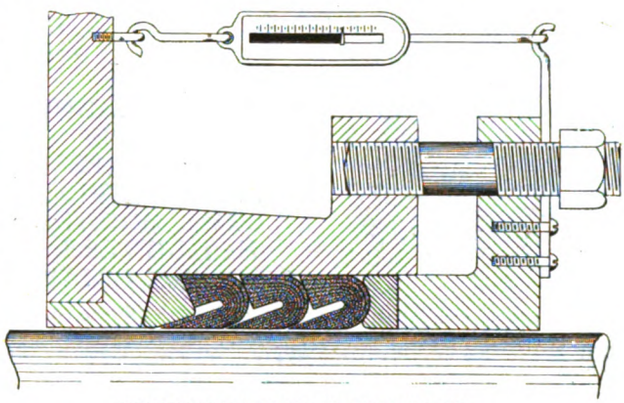
If a spring scale were fastened to the gland you could see how J-M Sea Rings save

Every ounce of tension on the gland bolts produces a proportional frictional pressure on the packing and rod. If the gland pressure is great, the packing pressure is great, and as the gland is freed the packing pressure decreases.

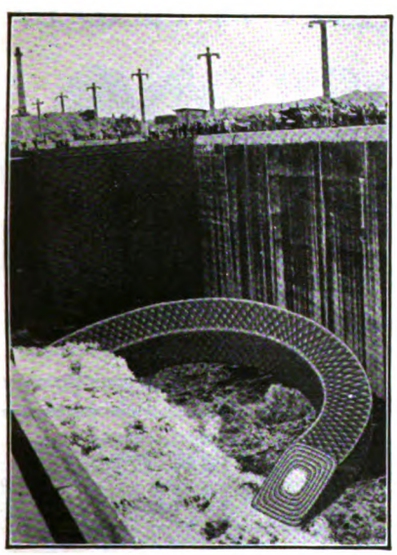
However, so as to withstand the greatest leakage tendency, the gland must be tight, when ordinary rod packing is used. The spring scale would then show constant maximum tension.

With Sea Rings in the same Stuffing Box, the spring scale would never show as great a tension, even when full boiler pressure was acting on the lips of the Rings. After the cut-off, the tension would further decrease and during exhaust, it would be practically at zero —when Sea Rings are used the gland is merely a Seating Plate for the packing.

These facts explain why Sea Rings are packing pressure savers, power savers and therefore money savers—and also why their life is so long. Try them.



HALF SECTIONAL VIEW OF STUFFING BOX PACKED WITH J.M. SEA RINGS



When it comes to resisting water under pressure—J-M Duplex is the "Gatun" of packings

J-M Duplex packed pumps are closed like a lock gate against fluid leakage. Duplex packed stuffing boxes that leak are as hard to find as a steam plant without a boiler.

And there are several good reasons why J-M Duplex is a good packing.

Only the best materials are used in it. Woven flax and finest rubber wrapped 'round a resilient central rubber core. Layer after layer of water-proofing is alternated with as many layers of flax fabric.

The packing is so resilient that water has about the same chance to get through it as it has to get through the walls of the steel gate at Gatun.

J-M Duplex never fails in service if it's handled right.

The J-M Branch nearest you will be glad to talk it, show it and sell it to you. Ask them.

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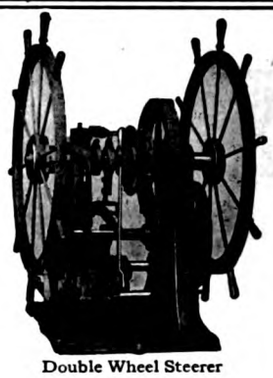
Single Wheel Steerer



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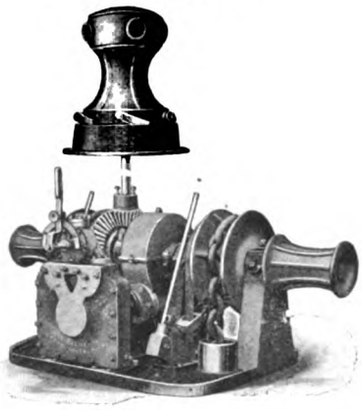
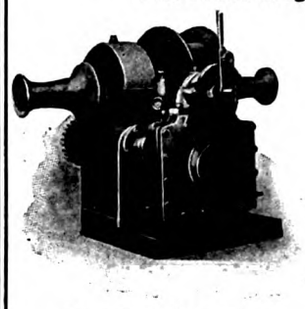


Steam Anchor Windlass



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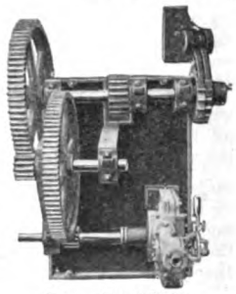

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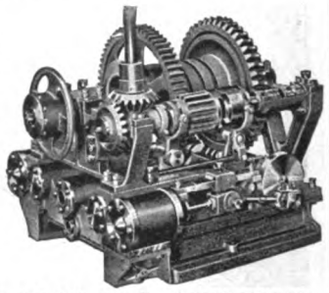

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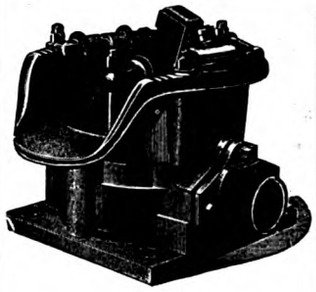

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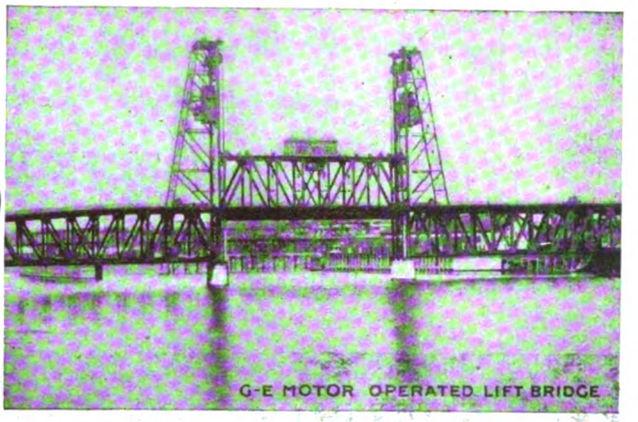

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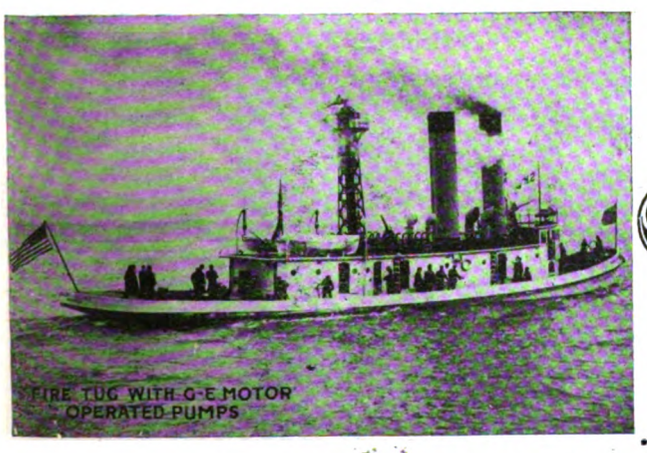

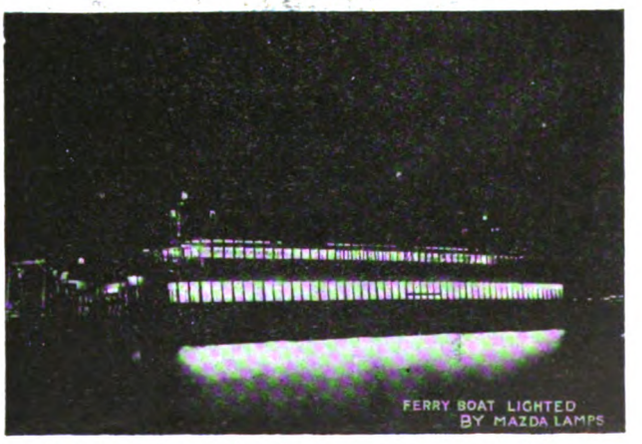

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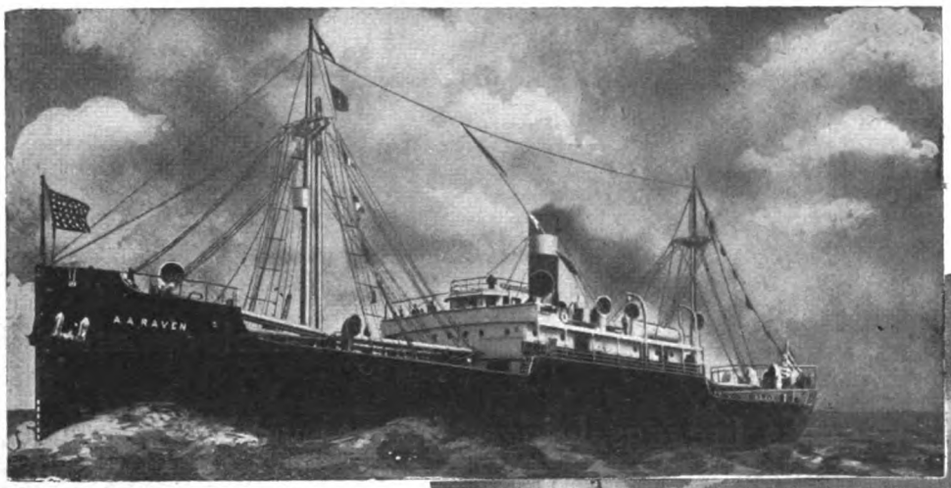

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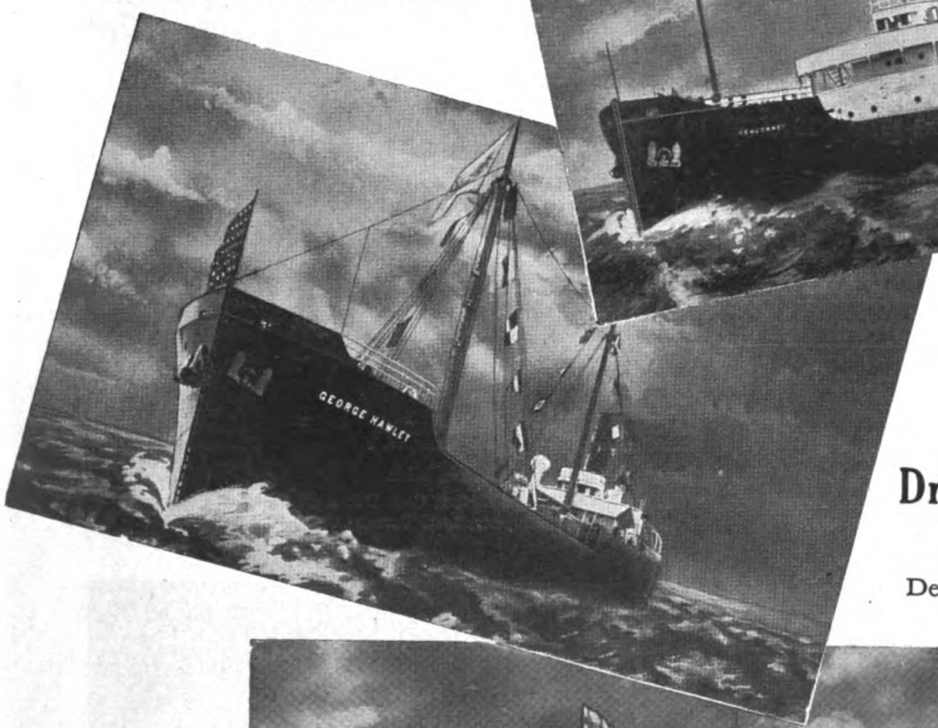

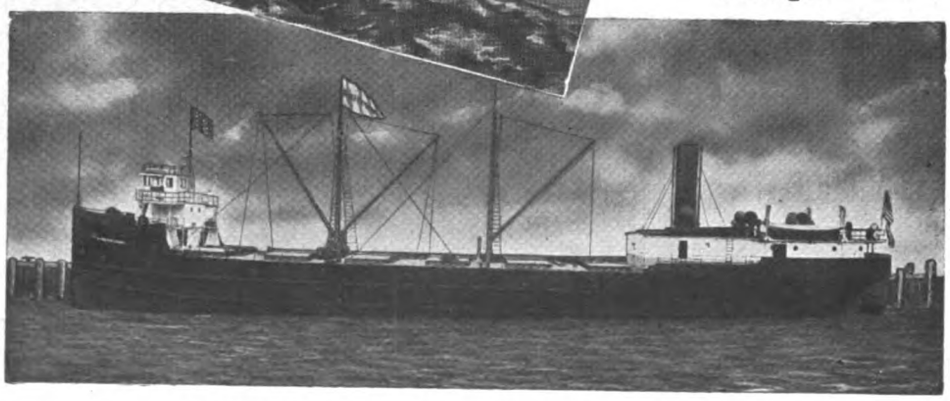

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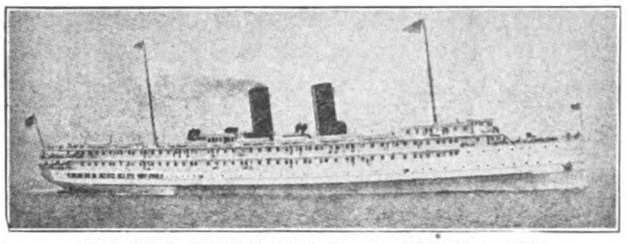

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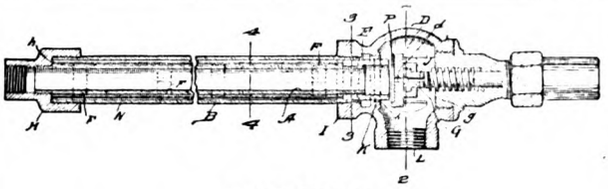

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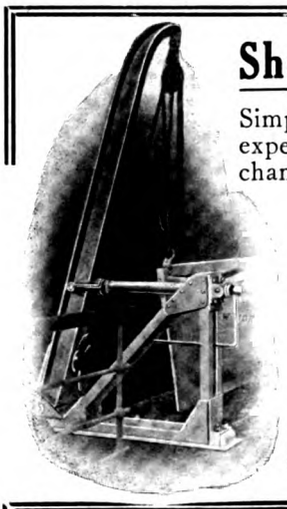

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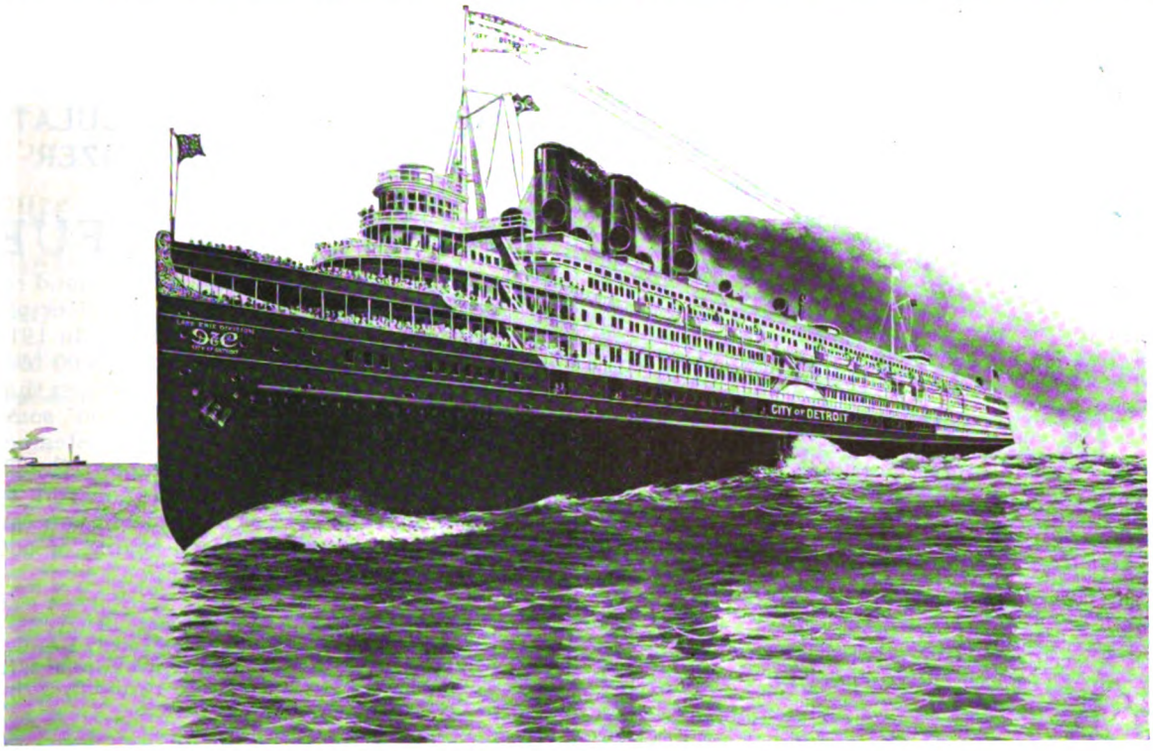

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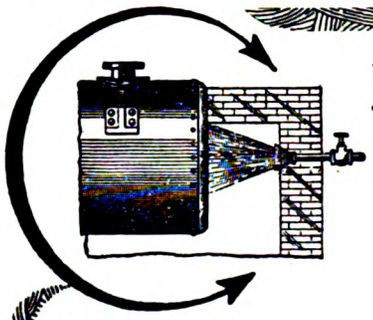

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Capt. W. C. Richardson of Cleveland reports:—"The Steamer 'David Z. Norton' in 1913 burned 4,600 tons of fuel. In 1914 she burned 3,600 tons or about 1,000 tons less in 1914 than in 1913. This shows that your Circulators saved the 'Norton' some fuel. The same applies to the Steamer 'L. B. Miller' and the Steamer 'C. R. Hubbard'. The boats did not run as many miles in 1914 as in 1913 but you can SAFELY say there was a saving of 600 tons on each vessel."

Capt. Wm. Smith of Steamer "Harvester" reports:—"Your Circulators have created a LARGE SAVING IN FUEL, for twenty-five trips in 1913 we consumed 6,245 tons and for twenty-five trips in 1914 we consumed 5,625 tons."

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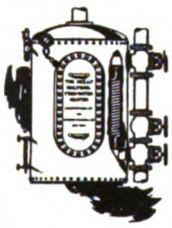

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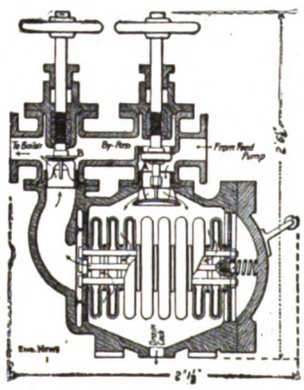

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ANY SIZE, OUTSIDE OR INSIDE DIAMETER.
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BOTH HOLLOW AND SOLID,
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THE BENEFITS OF PERFECT CIRCULATION

Are so well known and so vitally important that to be without them is folly. Why not realize these benefits in your boilers? Why not get the proofs from us and then put in a trial Eckliff installation? Write to-day.

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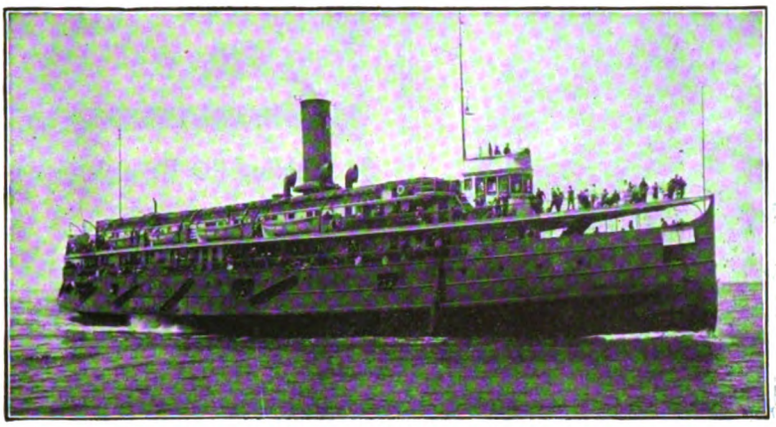

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EIGHT REASONS WHY

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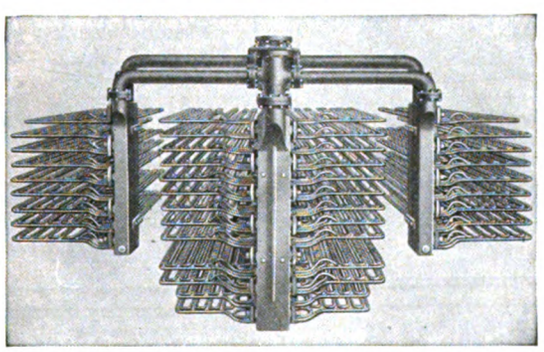

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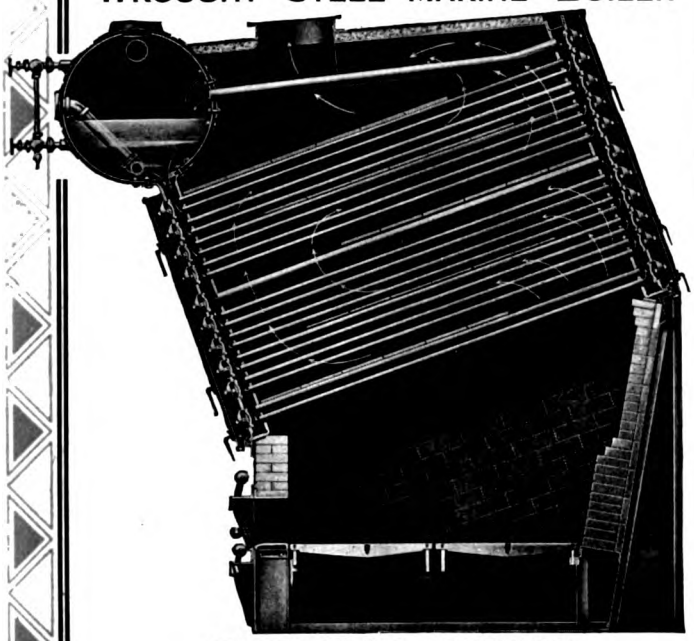

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The records for Economy, Capacity and Endurance in the Navies of the World, are held by

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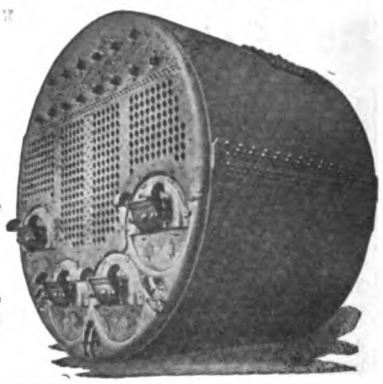
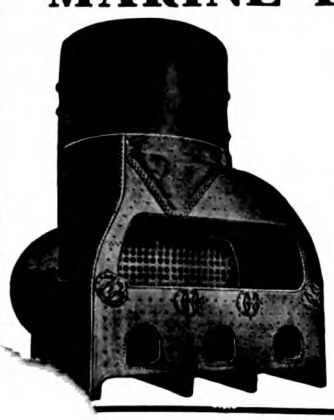


MARINE BOILERS



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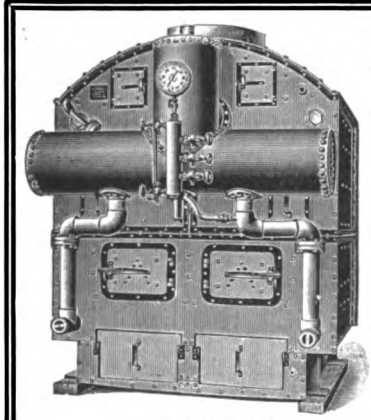

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WITH OIL ATTACHMENT
For protecting Lifeboats and Liferafts in a heavy sea, and preventing them from being capsized or swamped after being put into the water from an abandoned vessel until succor arrives; also for sea-going vessels.
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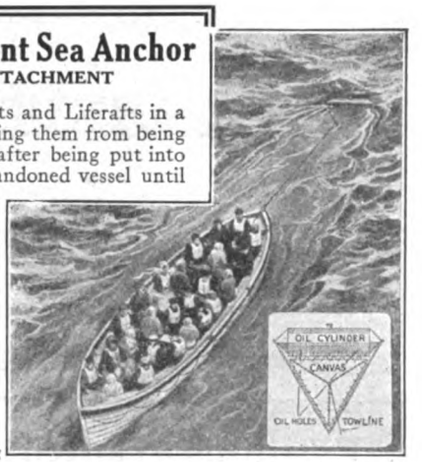

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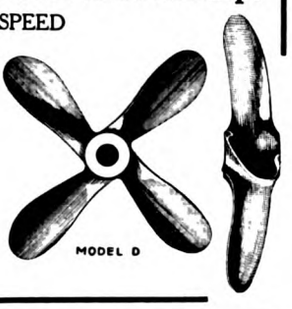

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Manufacturers of High Grade
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Large variety of Grate Bars in stock
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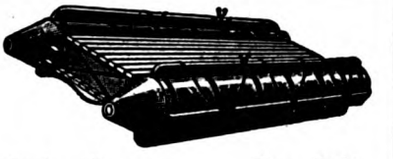

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Diving Apparatus and Submarine Armor
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Cork Cushions, Fenders, Cork Ring Buoys
"Ye Oldest Cork House in America"
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Famous for their QUALITY and ECONOMY
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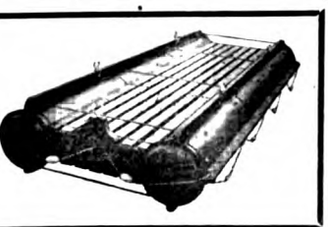

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Positions Wanted

POSITION WANTED AS MASTER mechanic, chief electrician or superintendent Coal or ore handling plants, at present in charge of one of the largest and most modern coal handling plants in the country. Specialist in the application of electric power and control devices and know the Hulett Electric Unloaders from A to Z. Address Box 115, THE MARINE REVIEW, Cleveland, O.

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Sells and Buys Boats of every class and type.

FOR SALE ON EASY TERMS OR WILL trade Tug Cadillac, perfect condition, allowed 125 lbs. steam. Charles Ryan, 4 Birge Bldg., Buffalo, N. Y.

IRON HULL 167 x 26 FT., FROM burned steamer Arundel, can be rebuilt at saving of about $15,000. Can be seen at Manistee. Pere Marquette Line Steamers, Manistee, Mich.

FOR SALE: — LOCOMOTIVE CRANES, McMyler revolving derricks, with clam shells. The Cleveland & Erie Machinery Co., Rockefeller Bldg., Cleveland, O.

THE OWNER OF THE CHOICE MILwaukee built, 300 ft. freight steamer Thomas Davidson (3,500 tons coal) retiring management now offers her for sale. Also the barge Baltic, about seventy thousand corn or wheat; twelve hundred thousand lumber capacity; large repairs recently. Towing machine, new cable, pumps, etc. Best offer takes them. H. J. Pauly, 165 Eighteenth St., Milwaukee, Wis.

FOR SALE:—SEVERAL VESSELS, ALL kinds and sizes; steam yachts, with speed exceeding 35 miles per hour; all in good condition and bargains. Prices, descriptions, etc., may be secured by addressing Box 100, THE MARINE REVIEW, Cleveland, O.

FOR SALE: — TWO SCOTCH MARINE boilers. Now on the dock of the Great Lakes Engineering Works, at Ecorse. These boilers are about 13 feet diameter and length and were allowed 125 lbs. steam when last inspected. Write O. W. Blodgett, Duluth, Minn.

GEORGE HALL COAL CO. OFFERS
For Sale.
Wooden Steamers
Phenix
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Henry B. Hall
Bargain counter prices
for cash.
May be seen at
Ogdensburg, N. Y.

FOR SALE: — COARSE FREIGHT steamer, 1,000 tons capacity, and two Barges, 1,200 tons each. All in first-class condition and carry highest Great Lakes rating. Address Box 112, THE MARINE REVIEW, Cleveland, Ohio.

FOR SALE WOODEN STEAMER WINnipeg lumber capacity 1,100,000 feet, coal 1,700 tons. Rebuilt recently. Address D. H. Andrews, Ellicott Sq., Buffalo, N. Y.

For Sale

FOR SALE: — CAR FERRY; CAN BE converted into sand sucker. Dimensions of ferry are 264 feet long, 53 feet beam, 14 feet depth. The rail above main deck is 8 feet high and upper four feet being of steel consisting of 4 plates, 24 inches wide by ¾ inch thick extending under bow and stern making complete arch full length across. Also strip of steel in deck, each side, 3 feet wide. The hull has combination steam windlass and capstan, 2 anchors and chains and Williamson steam steering gear. Can be seen at Manistee Iron Works, Manistee, Mich. Address A. W. Towsley, V. P. & G. M. Ann Arbor Railroad Co., Toledo, O.

A FINE STEAM LIGHTER OR BARGE 115 OVER ALL, 23.6 BEAM, 9.0 DEPTH OF HOLD DRAUGHT, 8.6 LOADED, HAS FORE AND AFT COMPOUND ENGINE 10 x 18.0 x 16.0 SCOTCH BOILER 125 LBS. STEAM. STEAM HOIST DOUBLE CYLINDER. A FINE BOAT AND THE PRICE IS RIGHT. ADDRESS BOX 117, THE MARINE REVIEW, CLEVELAND, O.

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PLANT FOR SALE: — ONE THREE cubic yard dipper dredge; 1 Tug Boat, 13 x 15 cylinder, hull 40 feet x 13 feet x 6 feet; 3 derrick scows; 1 flat scow 76 feet x 24 feet x 7 feet 6 inches; 2 three hundred cubic yard mud scows; one 1½ yard orange peel bucket; one 1¼ yard Williams clam shell bucket; one direct connected ¾ cubic yard concrete mixer; one marine lake type boiler 16 feet long, 9 feet in diameter, built for 145 pounds working pressure, heating surface 2,400 square feet. Great Lakes Construction Co., 1117 Chamber of Commerce building, Buffalo, N. Y.

FOR SALE: — STEAMER THISTLE. Cheap if taken at once. Inquire Hart Transportation Co., Sturgeon Bay, Wis.

A WELL EQUIPPED STEAMER 166 FT. keel, 32 ft. beam, 12 ft. depth of hold; rebuilt one year ago, class 95—patent anchors, steam windlass and capstan, 2 steam hoist—electric lights. For particulars and price write Gus. Clauson, 571 Fifth Ave., Milwaukee, Wis.

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THE "SHOP WINDOW" FOR OUTGROWN MARINE EQUIPMENT
A HABIT OF THRIFT THAT PAYS DIVIDENDS!
EVERY TRANSACTION REFLECTS THE VALUE OF THE SERVICE
MARINE REVIEW

An Inspirational Message From One Who Has Made Several Satisfactory Tests!

Office of M. C. FURSTENAU
Consulting Marine Engineer and Naval Architect
Philadelphia, Pa.

The Marine Review,
The Penton Pub. Co., Cleveland, Ohio

Gentlemen:—
My opinion, expressed to you in my letter dated May 1st, that one insertion of my advertisement would be sufficient, has proved correct. The insertion of this advertisement in one issue of THE MARINE REVIEW brought to my attention practically all of the available vessel properties and more than we could give consideration to.
The above facts, of course, make the continuation of our advertisement unnecessary.
Yours very truly, (Signed) M. C. FURSTENAU.

A Logical Conclusion

The results demonstrate that if there is any used marine equipment you wish to buy or sell, the place to tell it to the trade is in

THE MARINE REVIEW, Published at CLEVELAND, OHIO

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THE WELL KNOWN SHIP YARD AT New Baltimore, N. Y., consisting of large steam marine railway, sixty horsepower boiler and engine for hauling, smaller engine for sawing, one steam pump. Large steam saw and planing mill with Lane circular saw, also planer and other saw tables for ripping, etc. Large office building, mould loft, smith shop, barn, stables, tool shed, large lumber building and other sheds. Five hundred feet or more of water front, timber slip, launching slips, etc. Ship yard well equipped with derricks for hoisting, timber docks and buildings in good repair. Will sell on reasonable terms. Inquire of Wm. H. Baldwin, New Baltimore, N. Y.

FOR SALE: — STEEPLE COMPOUND Engine 7x14x12. Wheel shaft and bearings. One tubular marine boiler 10 ft. long, 48 in. diameter. Address L. Hohmann, 2457 Eastwood Ave., Chicago, Ill.

FOR SALE:—STEAMER MOHEGAN IN thorough condition throughout; rates 95 high power; two new Scotch boilers 11 ft. 6 in. x 14 ft. 6 in.; steel boiler house; recently in dry dock; will run 12 miles an hour light or loaded; capacity 1,200 M. ft. lumber; 1,600-1,700 tons coal. Also for sale, consort Mingoe, light draught, good condition, capacity 950 M. ft. lumber, 1,200-1,300 tons coal. Address Graves, Bigwood & Co., Buffalo, N. Y.

FOR SALE: — FIRST CLASS LIGHT draft 600,000 lumber steamer. Hull diagonally stripped and steel arched. Rate 90 c.f. Fore and aft engine 20 and 40 by 36. 3-furnace Scotch boiler, allow 125 lbs. pressure. Would make fine sand sucker. For price, etc., address Box 113, THE MARINE REVIEW, Cleveland, Ohio.

FOR SALE: — WOODEN STEAMER Caledonia, 277 ft. x 42 ft. x 21 ft.; capacity about 3,000 tons; fore and aft compound engine, 24 in. and 44 in. x 42 in. stroke; Two Scotch boilers, 10 ft. diameter x 11 ft. long, for 130 pounds; may be seen at the Ecorse Yard of the Great Lakes Engineering Works, Detroit, Mich. Would make first-class tow barge and will be sold cheap. For further particulars apply 1304 Rockefeller Bldg., Cleveland, Ohio.

FOR SALE: — SCHOONER JENNIE Weaver. Boat and running gear in good condition. The Mihlethaler Company, Ltd., Harbor Beach, Mich.

FOR SALE:—ALL STEEL TUG, 75 by 20 feet; 12-foot boiler, hull new 1910; built extra heavy for running in ice. At present being used in carrying 125 passengers. Can be seen at Buffalo. Wickwire Steel Co., Buffalo, N. Y.

FOR SALE.—GAS BOAT GLORIANA. Built in 1913. 62 ft. overall, 13 ft. beam, 6 ft. deep. 75-H. P. Kahlenberg engine. Speed 13 miles. E. G. Endress, Sault Ste Marie, Mich.

WANTED:—A GOOD SECOND-HAND marine engine and boilers. Or engine alone for a 4,000-ton boat. Give particulars. Address Box 107, THE MARINE REVIEW, Cleveland, Ohio.

FOR SALE

One second hand HYDE steam and hand drum steering engine with double engines 9 x 9. In first class condition. Price, $600.

One new HYDE double drum winch 8¼ x 10 link reverse. Has never been used. Price, $750.

Plans on application.

HYDE WINDLASS COMPANY,
Bath, Maine.

Wanted

WANTED: — GOOD MEDIUM SIZE dredge for reclaiming lands and drainage purposes. Give full particulars with price. Address Box 118, THE MARINE REVIEW, Cleveland, O.

For Sale

BARGE "CONNELLY BROS.", 201 x36x 13½ ft. Carries Million lumber. Steam windlass and capstan. Two steam hoisters. Winter quarters Erie, Pa.

FOR SALE:—SCHOONER J. H. MEAD, 388 tons net, will carry 400 M. hardwood—550 M. pine. Rebuilt lately. First class condition. Capt. A. Thompsen, 3708 McLean Ave., Chicago, Ill.

LARGE TUG FOR SALE 73 FT. x 17 FT. x 10 ft. in size with semi-Scotch marine boiler, allowed 140 pounds of steam, steam steerer, etc., entirely rebuilt last year, operating and in first-class condition.

ALSO SCOW, 185 FT. x 35 FT. x 10 FT. capacity 800 yards sand or gravel. Last year had installed modern 12-inch Morris centrifugal sand pumping outfit with large marine boilers, mooring engines and ballast pump, etc. Might consider trade for good real estate. Address W. C. Farrington, 316 Moffat building, Detroit, Mich.

FOR SALE—TWO, 4-CYLINDER, 40-H. P. Holliday gasoline marine engines, with shafts and wheels. Hibbard Spencer Bartlett & Co., State Street Bridge, Chicago, Ill.

FOR SALE: — SCHOONER MINERVA, Length 126 ft., beam 26 ft., depth 11 ft. 6 in. Thorough rebuilt and caulked in 1915. Rating 85, gross tonnage 222, net tonnage 211. For particulars address John Leonard, 3735 Ward St., Chicago, Ill.

For Sale

FOR SALE:—SCHOONER L. B. COATS, 189 gross tons, 3 masts, fully rigged, with canvas, together with complete diving rig, and wrecking outfit. Wm. McCullouch, Box 398, Port Huron, Mich.

LUMBER BARGE FOR SALE, 850,000 capacity; in first-class condition. If you want a bargain see this one. Address Box 111, THE MARINE REVIEW, Cleveland, Ohio.

FOR SALE CHEAP—STR. F. R. BUELL. Length, 194 ft.; beam, 35 ft. 5 in.; depth, 13 ft. 9 in. Carries lumber cargo 900,000 ft. Coal, 1,250 tons. Inquire A. Weston & Son, N. Tonawanda, N. Y.

FOR SALE CHEAP—BGE. A. STEWART. Length, 172 ft.; beam, 32 ft. 4 in.; depth, 12 ft. 1 in. Carries lumber cargo 750,000 ft. Coal, 1,000 tons. Boats have kept up in good condition. Inquire A. Weston & Son, N. Tonawanda, N. Y.

FOR SALE:—STEAM SAND SUCKER, fully equipped; capacity 180 yards, length 117 feet, beam 23 feet; draft; light 7 feet, loaded 10 feet; at a bargain price if taken at once. Address Box 94, THE MARINE REVIEW, Cleveland, O.

FOR SALE—LUMBER BARGE ALBERT Soper. Rating 90 C. F., capacity 300,000 hardwood, 425,000 pine; boiler pressure 150 lbs.; good economical boat; hull in first class condition throughout. Also tow barge Halstead, capacity 750,000 lumber; recently extensively rebuilt. Both boats now at Green Bay. Apply Greiling Bros. Co., Green Bay, Wis.

WANTED:—MARINE BOILER TO FURnish steam for engine 12 x 24 x 20, or 16 x 32 x 24, not less 150 pounds. Box H., Bayfield, Wis.

FOR SALE:—TUG RUNNELS, 58.9 x 15.3 ft. depth 6.9, draws 8 ft. of water. Gross tonnage 37.87, net 18. 16 sq. high pressure engine. Boiler about 120 lb. Dorr E. Warner, Atty., Cleveland, O.

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TWO PASSENGER BOATS

Capacity 500 to 2000

Describe fully in your reply

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1100 MORGAN BLDG.,
BUFFALO, N. Y.

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Inquire Charles S. Neff, 2109 Grand Ave., Milwaukee, Wis.

TWO SCOTCH MARINE BOILERS. Dimensions of each—Length 10 ft. 4 in., diameter 15 ft. 10 in. Grate Surface 71½ square feet. Steam pressure allowed 160 lbs. Heating surface 2652 square feet. An excellent pair of boilers for anyone that needs them. Address F. M. Dunbaugh, Pier 39, North River, New York, N. Y.

FOR SALE.

1—Providence Towing Machine.
2—Metallic Life Boats.
1—Double Drum Deck Engine.
1—Steam Capstan.
1—Improved Williamson Steering Engine.
Address 506 Smith building, Detroit, Mich.

For Sale

FOR SALE:—ONE FORE AND AFT engine, size 12-24x20 Baker Valve on high pressure, slide valve on low pressure directly connected on pump, feed pump and bilge pump, steam reverse and one 6 foot 8 in. wheel driving bearing and shaft complete from engine to wheel in good condition. Write Box H, Bayfield, Wis.

TWO WOODEN SAND AND GRAVEL steamers, fully equipped. Capacity 390 to 400 net tons. Our prices will interest you. Apply United Fuel & Supply Co., Detroit, Mich.

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End Openings Preferred

CAPACITY 30 AUTOMOBILES

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When and Where Last in Service

Describe Fully

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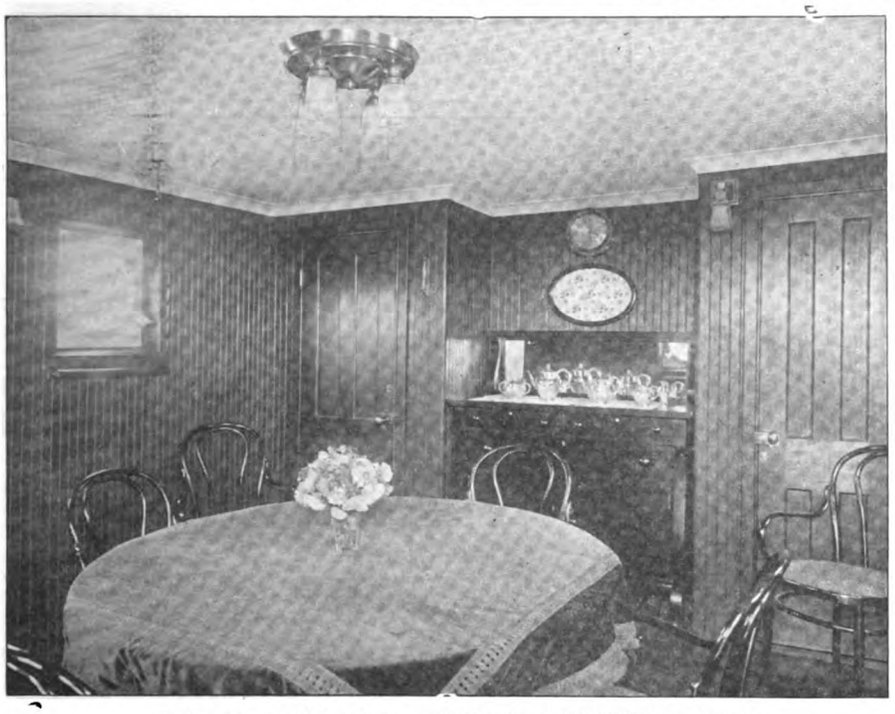
The only successful composition flooring for ships



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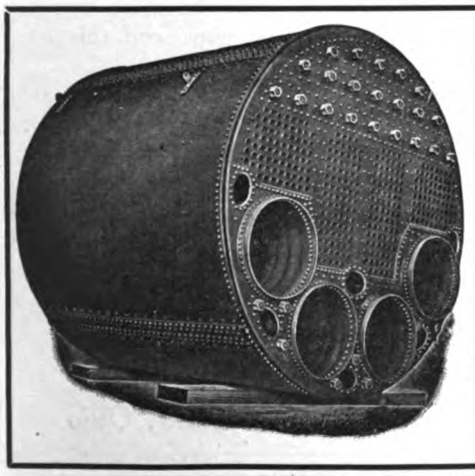

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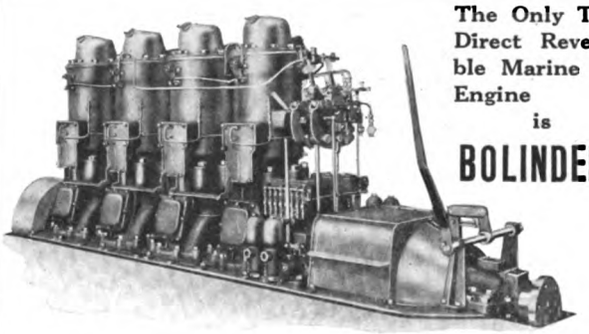

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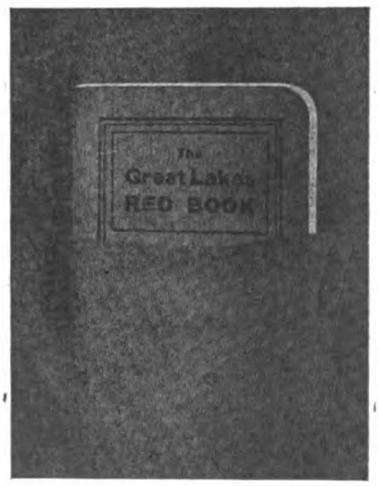

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It tells what boats are owned by each company, gives the name of the manager, and tells who is captain and who is engineer on each vessel.

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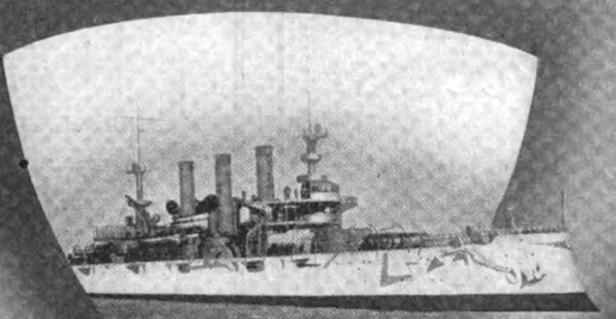

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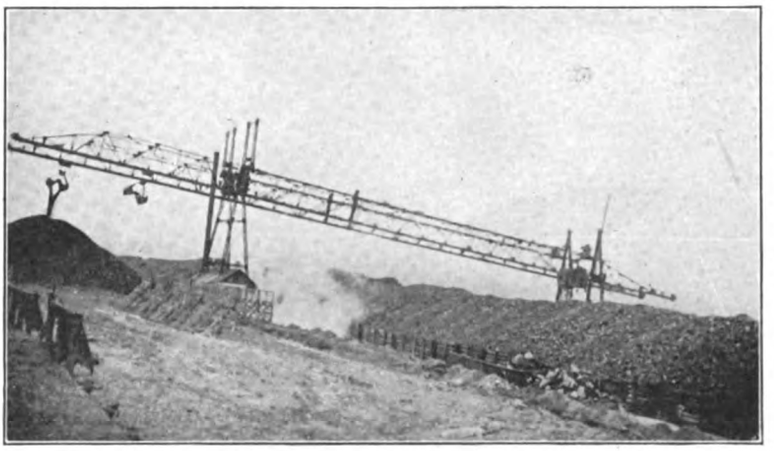

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Clam Shell Buckets

FOR SALE

Two 5-Ton McMyler All Steel Revolving Locomotive Cranes.

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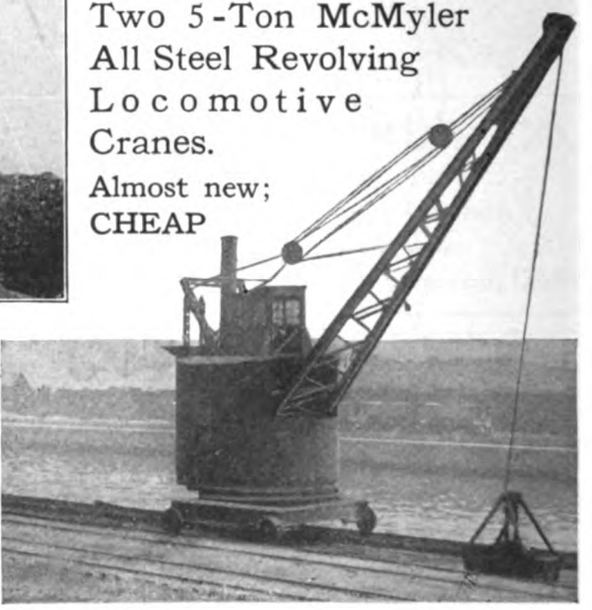

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Coal for Shipment via the Great Lakes

and

Vessel Fuel

Sales Agents Cleveland, O.

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Lidgerwood Mfg. Co.
Superior Iron Works

DESIGNERS.—(Ship.)
Babcock & Penton
Curr, Robert
Furstenau, M. C.
Hynd, Alexander

DIES.
Armstrong Mfg. Co.

DIVING APPARATUS.
Morse, A. J., & Son.
Schrader's Sons, A., Inc.

DOCKS—(Designers of.)
Donnelly, Wm. T.

DOCK BUILDING.
Breymann, G. H., & Bros.

DRAFT.—(Artificial and Mechanical for Boilers.)
American Blower Co.
American Ship Building Co.
Detroit Ship Building Co.
Great Lakes Engineering Works

DRAFT GAGE.
Blackmer Rotary Pump, Power & Mfg. Co.
McNab Co.

DREDGING OUTFITS. — (Constructors of.)
Buffalo Dry Dock Co.

DREDGING MACHINERY.
American Engineering Co.
Chase Machine Co.
Great Lakes Eng. Works.
Polson Iron Works, Ltd.
Superior Ship Building Co.

DROPS—(Wharf.)
American Engineering Co.

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DRY DOCKS.
American Ship Building Co.
Baltimore Dry Dock & Ship Bldg. Co.
Chicago Ship Building Co.
Collingwood Ship Building Co.
Detroit Ship Building Co.
Great Lakes Engineering Works
Kennedy Valve Mfg. Co.
Manitowoc Ship Bldg. & Dry Dock Co.
Milwaukee Dry Dock Co.
Seattle Construction and Dry Dock Co.
Superior Ship Building Co.
Tietjin & Lang Dry Dock Co.
Toledo Ship Building Co.

DYNAMOS.
General Electric Co.

EBONY.
Pearson, C. H.

EJECTORS.
Penberthy Injector Co.

EJECTORS. (Air.)
Westinghouse Machine Co.

EJECTORS.—(Ash.)
Great Lakes Engineering Works

ENAMELS.
Patterson-Sargeant Co.

ENGINEERS.—(Marine, Mechanical and Consulting.)
Babcock & Penton
Donnelly, Wm. T.
Downey Heating & Supply Co.
Farley, Edward P., Co.
Furstenau, M. C.
Griscom-Russel, The, Co.
Hynd, Alexander
Moore & Scott Iron Works.
Seattle Const. & Dry Dock Co.

ENGINEER'S SPECIALTIES
Carpenter, Geo. B., & Co.
Penberthy Injector Co.
Ross Valve Mfg. Co.

ENGINES.
American Engineering Co.
American Ship Building Co.
Bolinders Co.
Chase Machine Co.
Engberg's Electric & Mechanical Works.
Polson Iron Works, Ltd.
Seattle Construction & Dry Dock Co.
Southwark Fdy. & Mch. Co.
Superior Iron Works

ENGINES.—(Diesel Principle.)
Southwark Fdy. & Mch. Co.

ENGINES.—(Hoisting.)
American Blower Co.
American Engineering Co.
Chase Machine Co.
Hyde Windlass Co.
Lidgerwood Mfg. Co.
Superior Iron Works

ENGINES.—(Marine.)
American Blower Co.
American Ship Building Co.
Bath Iron Works
Bolinders Co.
Chase Machine Co.
Chicago Ship Building Co.
Collingwood Ship Building Co.
Detroit Ship Building Co.
Fletcher, W. A., Co.
Fore River Ship Building Corp.
Great Lakes Engineering Works
Johnston Bros.
Lidgerwood Mfg. Co.
Manitowoc Ship Bldg. & Dry Dock Co.
Milwaukee Dry Dock Co.
Polson Iron Works, Ltd.
Sheriffs Mfg. Co.
Southwark Fdy. & Mch. Co.
Superior Ship Building Co.
Toledo Ship Building Co.
Trout, H. G.

ENGINES.—(Mooring.)
American Engineering Co.
Chase Machine Co.
Lidgerwood Mfg. Co.

ENGINES.—(Steering.)
American Engineering Co.
Hyde Windlass Co.
Lidgerwood Mfg. Co.

ENGINE STOPPING DEVICES
Mulholland Hatch Fastener Co.

FANS.
American Blower Co.

FASTENERS.—(Hatch.)
Hynd, Alexander
Mulholland Hatch-Fastener Co.

FILTERS.—(Feed Water.)
Griscom-Russel, The, Co.
Ross Valve Mfg. Co.

FIRE ESCAPES
McArthur Portable Fire Escape Co.

FIRE ALARM SYSTEMS.
Cory, Chas., & Sons

FIRE DEPARTMENT SUPPLIES.
Hynd, Alexander
Morse, A. J., & Son

FIXTURES.
General Electric Co.

FLAGS.
Carpenter, Geo. B., & Co.

FLOORS.
Johns-Manville, H. W., Co.

FLOORING (Composition.)
Byerley & Sons

FLOORING (Warehouse.)
Byerley & Sons
Johns-Manville, H. W., Co.

FORGINGS
Collingwood Ship Building Co.
Valk & Murdock Co.

FORGINGS.—(Steel.)
Fore River Ship Building Corp.

FOUNDERS.
Chase Machine Co.
Kingsford Foundry & Machine Works
Seattle Const. & Dry Dock Co.

FUELING COMPANIES AND COAL DEALERS.
Hall, Geo., Coal Co.
Hanna, M. A., & Co.
Lorain Coal & Dock Co.
Pickands, Mather & Co.

FURNACES.—(Boilers.)
Continental Iron Works, The

FURNACE FRONTS AND DOORS.—(Land and Marine.)
Continental Iron Works, The

GAGES.—(Steam.)
Ashton Valve Co.

GAGES.—(Water.)
Penberthy Injector Co.

GASKETS.
Johns-Manville, H. W., Co.

GEARS.—(Reduction.)
Westinghouse Machine Co.

GENERATORS.
Engberg's Electric & Mechanical Works.
General Electric Co.
International Oxygen Co.

GLUE.—(Marine.)
Ferdinand, L. W., & Co.

GLUE.—(Waterproof Liquid.)
Ferdinand, L. W., & Co.

GRAPHITE.
Dixon, Joseph, Crucible Co.
Johns-Manville, H. W., Co.

GRAPHITE.—(Boiler Lubricating, Greases.)
Dixon, Joseph, Crucible Co.

GRATE BARS.
Polson Iron Works, Ltd.
Sheriffs Mfg. Co.
Trout Co., H. G.

GREASES.
Dixon, Joseph, Crucible Co.

GYPSEYS.—(Steam.)
American Engineering Co.

HAMMERS.—(Steam.)
Chase Machine Co.

HARDWARE.
Carpenter, Geo. B., & Co.

HARDWOODS.—(Tropical.)
Pearson, C. H.

HATCH COVERS.
Carpenter, Geo. B., & Co.

HATCH FASTENERS.
Hynd, Alexander
Mulholland Hatch Fastener Co.

HEATERS AND PURIFIERS.—(Feed Water.)
Ross Valve Mfg. Co.

HOISTS.—(Air.)
American Ship Building Co.
Great Lakes Engineering Works

HOISTS.—(Anchor.)
Superior Iron Works

HOISTS.—(Cargo, Etc.)
American Engineering Co.
Boston & Lockport Block Co.
Chase Machine Co.
Dake Engine Co.
General Electric Co.
Lidgerwood Mfg. Co.

HOISTS.—(Chain.)
Dake Engine Co.

HOISTS.—(Electric.)
American Engineering Co.
General Electric Co.
Lidgerwood Mfg. Co.

HOISTS.—(Pneumatic.)
Dake Engine Co.

HOSE.
Schrader's Son, A., Inc.

HOTELS.
Hotel Tuller

HYDROGEN GENERATORS.
International Oxygen Co.

ICE MACHINES.
Kroeschell Bros. Ice Mach. Co.
Roelker, H. B.
Westinghouse Machine Co.

ICE MACHINES.—(Carbonic System.)
Kroeschell Bros. Ice Machine Co.

INDICATORS.
Electro Dynamic Co.
McNab Co.

INDICATORS.—(Direction.)
Cummings Ship Instrument Wks.
Electro Dynamic Co.
McNab Co.

INDICATORS.—(Recording.)
McNab Co.

INDICATORS.—(Speed.)
Johns-Manville, H. W., Co.
McNab Co.

INJECTORS.
Penberthy Injector Co.

INSULATION.—(Asbestos and Electrical.)
Johns-Manville, H. W., Co.

INSURANCE.—(Marine.)
Boland & Cornelius
Hutchinson & Co.
Richardson, W. C., & Co.
Vance & Joys Co.

IRON ORE.
Hanna, M. A., & Co.
Pickands, Mather & Co.

LADDERS.—(Portable.)
McArthur Portable Fire Escape Co.

LAMPS.—(Mazda and Arc.)
General Electric Co.

LANTERNS.—(Buoy.)
Safety Car Heating & Lighting Co.

LAUNCHES.
Drein, Thomas & Sons

LIFE BOATS
Carpenter, Geo. B., & Co.
Detroit Ship Bldg. Co.
Drein, Thomas & Son
Kahnweiler's Son, David
Lane, C. M., Life Boat Co.
Welin Marine Equipment Co.

LIFE RAFTS.
Detroit Ship Building Co.
Drein, Thos., & Son
Lane, C. M., Life Boat Co.

LIFE BOAT RELEASING DEVICE.
Lane, C. M., Life Boat Co.
Mulholland Hatch Fastener Co.
Raymond, James R.

LIFE BOAT SYSTEM.
Lane, C. M., Life Boat Co.
Welin Marine Equipment Co.

LIFE PRESERVERS.
Bauer, Justus, & Son, Inc.
Kahnweiler's Sons, David
Lane, C. M., Life Boat Co.

LIFE SAVING EQUIPMENT.
Bauer, Justus, & Son, Inc.
Drein, Thos., & Son
Kahnweiler's Sons, David
Lane, C. M., Life Boat Co.
Welin Marine Equipment Co.

LIGHTING.—(Turbo-Generator Sets.)
Westinghouse Machine Co.

LIGHTS.
Safety Car Heating & Lighting Co.

LIGHTS.—(Electric.)
Cory, Chas., & Son
General Electric Co.

LINOLEUM CEMENT.
Ferdinand, L. W., Co.

LINOLEUM CLEANER.
Ferdinand, L. W., & Co.

LINOLEUM FINISH.
Ferdinand, L. W., & Co.

LIQUID WATERPROOFING.
Ferdinand, L. W., & Co.

LOGS.—(Patent.)
Cummings Ship Instrument Wks.

LOGS.—(Ship.)
Walker, Thomas, & Sons

LUBRICANTS.
Dixon, Joseph, Crucible Co.

LUBRICATING GRAPHITE.
Dixon, Joseph, Crucible Co.

LUBRICATORS.
Penberthy Injector Co.

MACHINERY.
Kingsford Foundry & Machine Works

MACHINERY.—(Marine.)
American Ship Building Co.
Chase Machine Co.
Chicago Ship Building Co.
Collingwood Ship Bldg. Co.
Dake Engine Co.
Detroit Ship Building Co.
Fletcher Co., W. & A.
Fore River Ship Building Corp.
Great Lakes Engineering Works
Johnston Bros.
Manitowoc Ship Bldg. & Dry Dock Co.
Polson Iron Works, Ltd.
Sheriffs Mfg. Co.
Superior Iron Works
Superior Ship Building Co.
Toledo Ship Building Co.

MACHINISTS.
Chase Machine Co.
Downey Heating & Supply Co.
Superior Iron Works
Marine Equipment
Seattle Construction & Dry Dock Co.

MARINE GLUE.
Ferdinand, L. W., & Co.

MARINE TURBINES.
Westinghouse Machine Co.

MARLINE.
Waterbury Co.

MARLINE COVERED WIRE ROPE.
Waterbury Co.

MECHANICAL WORKS.
Engberg's Elec. & Mech. Wks.

METERS.—(Torsion.)
Cummings Ship Instrument Co.

MOORING LINES
Durable Wire Rope Co.

MOTORS.—(Electric.)
Electro Dynamic Co.
General Electric Co.

MOTORS.—(Winch.)
General Electric Co.

MUSIC WIRE.
Waterbury Co.

NAUTICAL INSTRUMENTS.
Carpenter, Geo. B., & Co.
Ritchie, E. S., & Sons.

NON-SLIP ADHESIVE FOR RUGS.
Ferdinand, L. W., & Co.

NOZZLES.
Morse, A. J., & Sons

OAKUM.
Carpenter, Geo. B., & Co.
Stratford Oakum Co., Geo.

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Dixon, Joseph, Crucible Co.

OIL.—(Linseed.)
Patterson Sargeant Co.

OIL ENGINES.
Bolinders Co.
Southwark Fdy. & Mch. Co.

OXYGEN AND HYDROGEN CYLINDERS AND CYLINDER STUD VALVES.
International Oxygen Co.

OXYGEN TESTING APPARATUS, WELDING AND CUTTING APPARATUS.
International Oxygen Co.

OXYGEN GENERATORS
International Oxygen Co.

PACKING.
Carpenter, Geo. B., & Co.
Home Rubber Co.
Johns-Manville, H. W., Co.

PACKING.—(Metallic, Sheet Rubber, Spiral and Coil Steam.)
Johns-Manville, H. W., Co.

PAINT.—(Copper and Iron.)
Patterson-Sargeant Co.

PAINT.—(Graphite.)
Dixon, Joseph, Crucible Co.
Patterson-Sargeant Co.

PAINT.—(Hull.)
Patterson-Sargeant Co.

PAINT.—(Marine.)
Patterson-Sargeant Co.

PAINTINGS.
Marine Art Co.

PANELS.
Keyes, The, Products Co.

PATENTS.
Siggers & Siggers

PIG IRON
Hanna, M. A., & Co.
Pickands, Mather & Co.

PIPE.—(Welded Steel.)
Continental Iron Works, The

PIPE COVERING.
Johns-Manville, H. W., Co.

PIPE BENDING MACHINES.
Cox Engrg. & Tube Bending Machine Works.

PISTONS.
(Cylinder.)
Baker Valve Co.

PLUMBAGO.
Dixon, Joseph, Crucible Co.

POWER PLANTS.
General Electric Co.

PROJECTORS.—(Electric.)
General Electric Co.

PROPELLER BLADES.
Sheriffs Mfg. Co.

PROPELLER WHEELS.
American Ship Building Co.
Case, A. Wells, & Son
Detroit Ship Building Co.
Fore River Ships Building Corp.
Great Lakes Eng. Works
Hyde Windlass Co.
Milwaukee Dry Dock Co.
Polson Iron Works, Ltd.
Roelker, H. B.
Sheriffs Mfg. Co.
Superior Ship Building Co.
Toledo Ship Building Co.
Trout Co., H. G.

PROVISIONS.—(Ship.)
Brogan, J. P.
Gehm, John
City & Marine Meat Market.
Erdman, Joseph
Gunn, P. J.
Jung, J. & W., Co.
Karr, J. W., Marine Supply Co.
Koehler Bros.
Miller, J.
Schroeder Bros. Co.
Schuette Bros. Co.
Spademan & Co.
Williams, William.

PUMPS.
Boston Lockport & Block Co.

PUMPS AND APPLIANCES.—(Air.)
Great Lakes Engineering Works
Kingsford Fdy. & Machine Co.

PUMPS.—(Bilge.)
Blackmer Rotary Pump, Power & Mfg. Co.

PUMPS.—(Miscellaneous Use.)
Blackmer Rotary Pump, Power & Mfg. Co.
Great Lakes Engineering Works.
Kingsford Fdy. & Machine Co.
Roelker, H. B.

RAFTS.
Carpenter, Geo. B., & Co.

REDUCTION GEARS.
Westinghouse Machine Co.

REFRIGERATING MACHINERY.
Clothel, The, Co.
Great Lakes Eng. Works
Johns-Manville, H. W., Co.
Kroeschell Bros. Ice Machine Co.
Roelker, H. B.
Westinghouse Machine Co.

REGULATORS.—(Pressure.)
Ross Valve Mfg. Co.

RELEASING DEVICE.—(Life Boat.)
Mulholland Hatch Fastener Co.

RELEASING HOOKS.
Raymond, James R.

REPAIRS.—(Boiler.)
Commercial Boiler Works, The
Michigan Salt Works

REPAIRS.—(Marine.)
American Ship Building Co.
Baltimore Dry Dock & Ship Bldg. Co.
Buffalo Dry Dock Co.
Chicago Ship Building Co.
Collingwood Ship Building Co.
Delaney, P., & Co.
Detroit Ship Building Co.
Fore River Ship Building Corp.
Goldschmidt Thermit Co.
Great Lakes Engineering Works
Johnston Bros.
Kennedy Valve Mfg. Co.
Manitowoc Ship Bldg. & Dry Dock Co.
Milwaukee Dry Dock Co.
Polson Iron Works, Ltd.
St. Lawrence Marine Ry. Co.
Seattle Construction & Dry Dock Co.
Sheriffs Mfg. Co.
Superior Ship Building Co.
Tietjen & Lang Dry Dock Co.
Toledo Ship Building Co.
Valk & Murdock Co.

REVOLUTION COUNTERS.
Cummings Ship Instrument Co.

RIVETS.—(Steel for Ships and Boilers.)
Great Lakes Engineering Works.

ROPE.
Durable Wire Rope Co.
Rinek Cordage Co.

ROPE.—(Wire, Manilla & Fibre-clad.)
Broderick & Bascom Rope Co.
Waterbury Co.

ROPE AND FITTINGS.
Durable Wire Rope Co.

ROPE DRESSING.
Dixon, Joseph, Crucible Co.

ROPE DRIVES.
Waterbury Co.

SEARCHLIGHTS.
Engberg's Electric & Mechanical Works.
General Electric Co.

SHEAVES.
Boston & Lockport Block Co.

SHEAVE LUBRICATING DEVICE.
Mulholland Hatch Fastener Co.

SHEET IRON WORK
Commercial Boiler Works, The
Polson Iron Works, Ltd.

SHIP BUILDING SYSTEM.
Isherwood, J. W.

SHIPS.—(Builders of.)
American Ship Building Co.
Baltimore Dry Dock & Ship Bldg. Co.
Bath Iron Works
Buffalo Dry Dock Co.
Chicago Ship Building Co.
Collingwood Ship Building Co.
Detroit Ship Building Co.
Fletcher, W. & A., Co.
Fore River Ship Building Corp.
Great Lakes Engineering Works
Johnston Bros.
Kennedy Valve Mfg. Co.
Manitowoc Ship Building & Dry Dock Co.
Milwaukee Dry Dock Co.
Moore & Scott Iron Works.
Polson Iron Works, Ltd.
Seattle Const. & Dry Dock Co.
Superior Ship Building Co.
Tietjen & Lang Dry Dock Co.
Toledo Ship Building Co.

SMOKE STACKS.
Lake Erie Boiler Works

SPECIALTIES.—(Steam.)
Hynd, Alexander
Penberthy Injector Co.
Ross Valve Mfg. Co.

SPRINGS.—(Bed & Bunk.)
Southern Bedding Co.

STAYBOLTS.—(Boiler, Iron or Steel, Hollow or Solid.)
Falls Hollow Staybolt Co.

STEAMFITTERS.
Downey Heating & Supply Co.

STEAMSHIP LINES.—(Passenger and Freight.)
American Line
International Mercantile Marine Co.

STEERING GEARS.
American Engineering Co.
American Ship Building Co.
Chase Machine Co.
Dake Engine Co.
Detroit Ship Building Co.
Hyde Windlass Co.
Sheriffs Mfg. Co.

STOCKS.
Armstrong Mfg. Co.

STOKERS.
American Engineering Co.
Babcock & Wilcox Co.

STOPPERS.—(Chain.)
American Engineering Co.

SUBMARINE ARMOR.
Morse, A. J., & Son
Schrader's Son, Inc., A.

SUBMARINE WORK.
Great Lakes Dredge & Dock Co.

SUPERHEATERS.—(Marine.)
Babcock & Wilcox Co.
Locomotive Superheater Co.

SUPPLIES.—(Marine.)
Carpenter, Geo. B., & Co.

SUPPLY HOUSES.
Brogan, J. P.
Gehm, John.
City & Marine Meat Market.
Erdman, Joseph.
Gunn, P. J.
Jung, J. & W., Co.
Karr, J. W., Marine Brokerage Co.
Koehler Bros.
Miller, J.
Schroeder Bros. Co.
Schuette Bros. Co.
Spademan & Co.
Williams, William

SURVEYORS.—(Marine.)
Babcock & Penton
Curr, Robert
Furstenau, M. C.
Hynd, Alexander

SWITCHBOARDS.
General Electric Co.

TANKS.
Bath Iron Works
Polson Iron Works, Ltd.

TANKS.—(Riveted.)
Lake Erie Boiler Works

TANKS.—(Steel.)
Fore River Ship Building Corp.

TANKS.—(Welded Steel.)
Continental Iron Works, The

TELEGRAPH.—(Mechanical.)
Cory, Chas., & Sons

TESTS OF MATERIALS.
Babcock & Penton
Curr, Robert
Furstenau, M. C.
Hynd, Alexander

THERMIT.
Goldschmidt Thermit Co.

TILING.
Keyes, The, Products Co.

TOWING LINES.—(Manila, Wire.)
Waterbury Co.

TOWING MACHINES.
American Engineering Co.
Chase Machinery Co.

TRAMWAYS.—(Wire Rope.)
Waterbury Co.

TRANSMISSION.—(Rope.)
Waterbury Co.

TRAPS.—(For all Uses.)
Barton Steam Trap Co.

TRAPS.—(Steam.)
Barton Steam Trap Co.

TUGS.
Bath Iron Works
Polson Iron Works, Ltd.

TURBINES.
Bath Iron Works
Fletcher, W. A., & Co.
Fore River Ship Building Corp.
Westinghouse Machine Co.

TURBO-LIGHTING SETS.
Westinghouse Machine Co.

VALVES.
Ashton Valve Co.
Penberthy Injector Co.
Ross Valve Mfg. Co.

VALVES.—(Piston.)
Baker Valve Co.

VALVES.—(Regulating.)
Barton Steam Trap Co.

VALVES.—(For Water and Gas.)
Ashton Valve Co.

VESSEL AGENTS.
Vance & Joys Co.

VESSEL BROKERS.
Farley, Edward P., Co.
Richardson, W. C., & Co.

WATERPROOF LIQUID GLUE.
Ferdinand, L. W., & Co.

WELDING.—(Electric.)
Michigan Salt Works.

WELDING.—(Flue.)
Case, A. Wells, & Son

WELDING PROCESSES.
Goldschmidt Thermit Co.

WINCHES.
American Engineering Co.
Chase Machine Co.
Hyde Windlass Co.
Lidgerwood Mfg. Co.

WINDLASSES.
American Engineering Co.
American Ship Building Co.
Carpenter, Geo. B., & Co.
Dake Engine Co.
Hyde Windlass Co.

WIRE.
Waterbury Co.

WIRE AND WIRING DEVICES.
General Electric Co.

WIRE ROPE.
Broderick & Bascom Rope Co.
Durable Wire Rope Co.
Waterbury Co.

WIRE ROPE DRESSING.
Dixon, Joseph, Crucible Co.

YACHTS.—(Builders.)
Bath Iron Works
Polson Iron Works, Ltd.

YACHT PLUMBAGO.
Dixon, Jos., Crucible Co.

YARN.—(Lath, Fodder.)
Waterbury Co.

YAWLS.
Drein, Thos., & Son
Manitowoc Ship Bldg. & Dry Dock Co.

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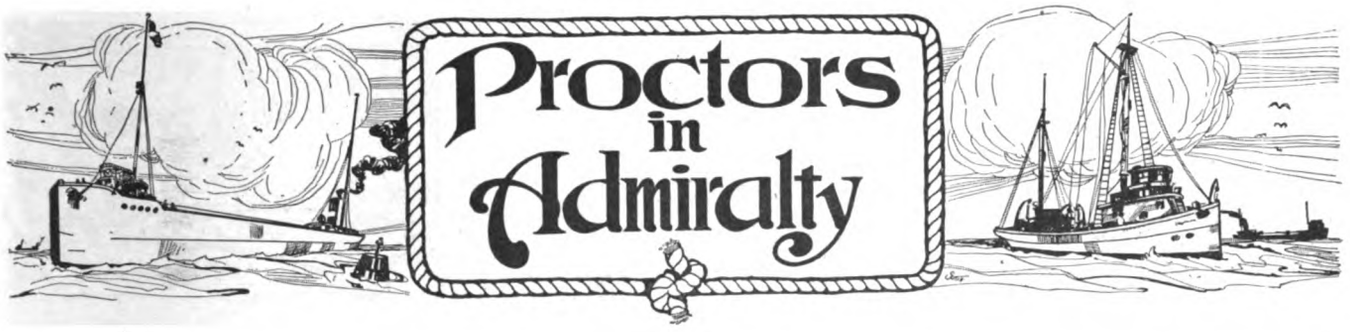

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PROCTOR IN ADMIRALTY
Rockefeller Building
CLEVELAND, O.

C. E. KREMER,
COUNSELOR AT LAW AND
PROCTOR IN ADMIRALTY
Suite 1012-1016 Insurance Exchange Building
CHICAGO, ILL.

GOULDER, WHITE AND GARRY
LAW OFFICES
Rockefeller Building CLEVELAND, O.

Walter I. Lillie Leo C. Lillie Hugh E. Lillie
LILLIE, LILLIE & LILLIE
LAWYERS
Proctors in Admiralty, General Practitioners
and Commercial Collections
Business Address, GRAND HAVEN, MICHIGAN

S. H. HOLDING, F. S. MASTEN, T. H. DUNCAN and F. L. LECKIE
HOLDING, MASTEN, DUNCAN & LECKIE
ATTORNEYS AT LAW AND
PROCTORS IN ADMIRALTY
840-848 Rockefeller Building CLEVELAND, O.

Spencer & Spencer
ATTORNEYS AT LAW
PROCTORS IN ADMIRALTY
Alworth Building, Duluth, Minn.

HOYT, DUSTIN, KELLEY, McKEEHAN & ANDREWS,
LAWYERS AND PROCTORS IN ADMIRALTY
Offices, 702 Western Reserve Bldg.,
CLEVELAND, O.

WARREN, CADY, LADD & HILL
ATTORNEYS AT LAW AND PROCTORS
IN ADMIRALTY
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William B. Cady
Sanford W. Ladd
Joseph G. Hamblen, Jr.
Sherwin A. Hill
Claudius B. Grant, Counsel
Union Trust Building, Detroit

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BOLAND & CORNELIUS

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Marine Insurance Agents

1204 Prudential Building,
BUFFALO, N. Y.

D. SULLIVAN — A. C. SULLIVAN

D. SULLIVAN & COMPANY

VESSEL AGENTS

Continental & Commercial Bank Building
208 South LaSalle Street
CHICAGO, ILL.

C. L. Hutchinson — W. H. McGean

HUTCHINSON & CO.

VESSEL AND INSURANCE AGENTS

Phones: Office; Main 2453
Res. C. L. Hutchinson, Marlo 244
Res. W. H. McGean, Garfield 274

1011 Leader-News Bldg. — Cleveland

VANCE & JOYS CO.

VESSEL AND INSURANCE AGENTS

1004-1006 First National Bank Building

TELEPHONE MAIN 3907

MILWAUKEE, WIS.

W. C. Richardson — Clarence E. Richardson
John T. Kelly — Tracy H. Paine

W. C. RICHARDSON & CO.

VESSEL OWNERS AND BROKERS AND
MARINE INSURANCE AGENTS

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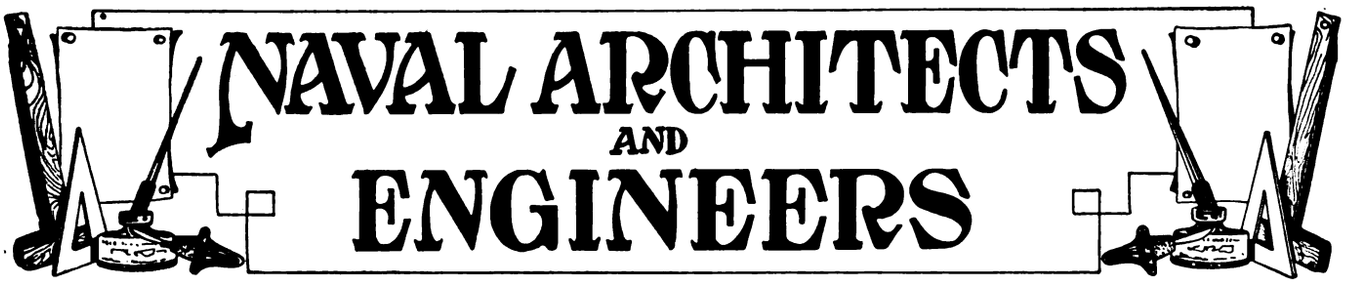

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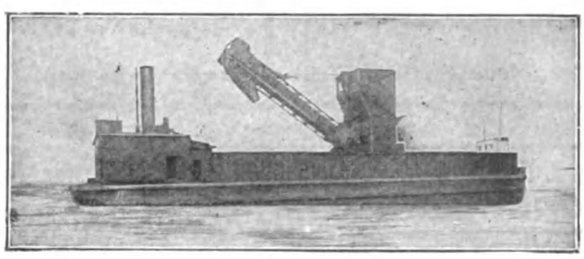

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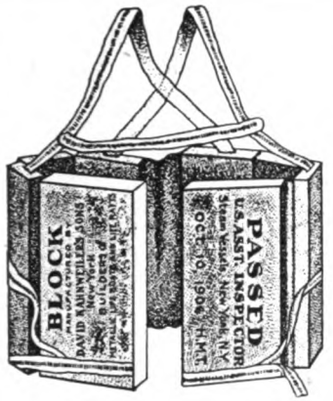

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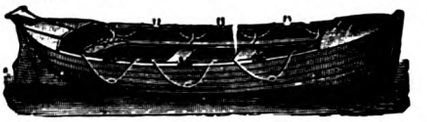

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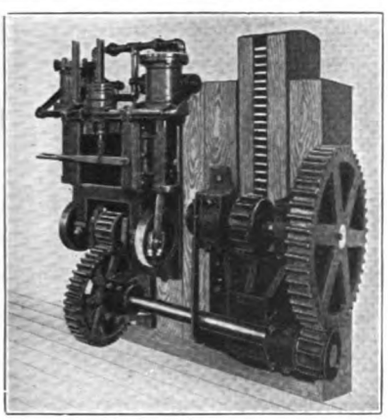

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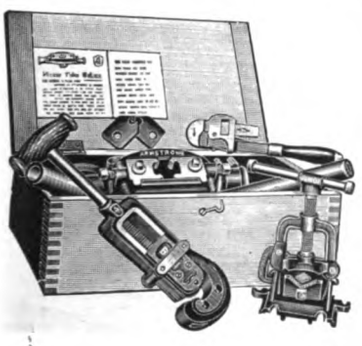

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1 Junior Hinged Pipe Vise	⅛	" 1¼
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STOCKS ARE FITTED WITH BARD ADJUSTABLE BUSHING IN A HARD WOOD CASE
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No other INJECTOR on the market so simple, reliable or durable.

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should be in the pilot house, not in the vessel's vitals.

When your ship is running through a fog and you want to cover a certain distance on a given course, you need an instrument that will tell you instantly and accurately how far you have gone.

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placed in the pilot house registers the exact distance travelled and eliminates any possibility of accident or loss of time.

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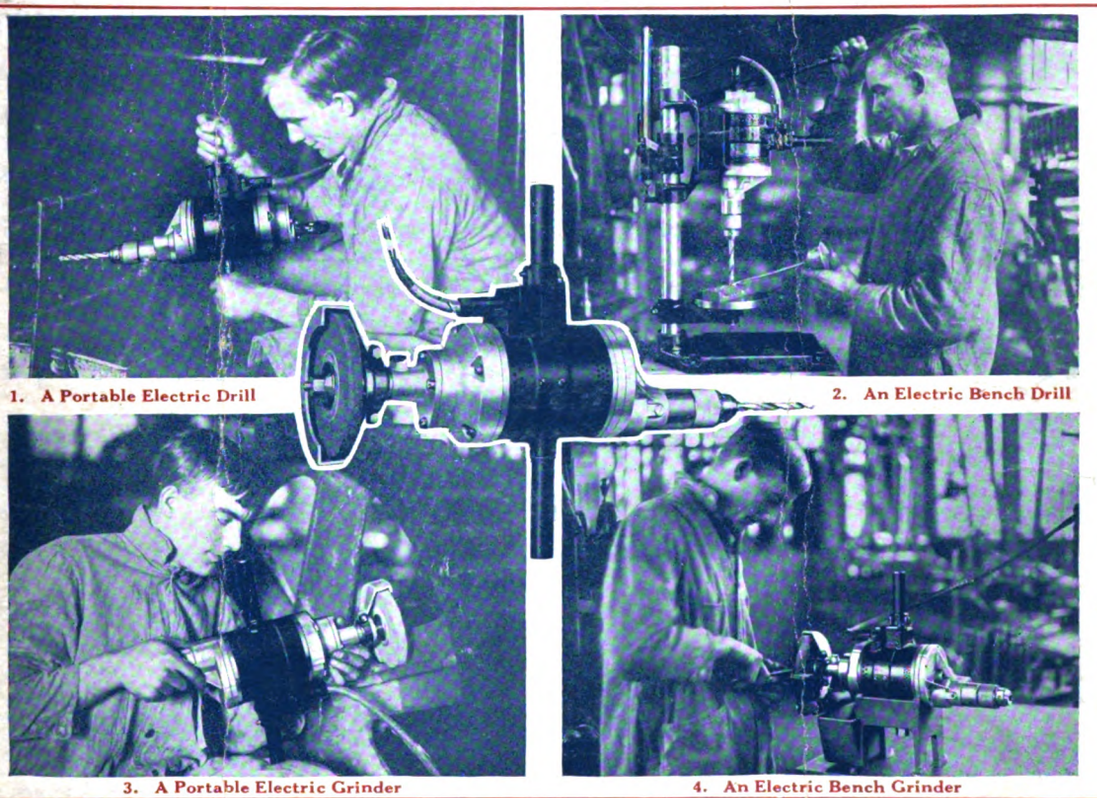
THE MARINE REVIEW

VOL. 46 CLEVELAND MARCH 1916 NEW YORK No. 3

A Special Van Dorn Utility Tool



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3. A Portable Electric Grinder
4. An Electric Bench Grinder

Van Dorn Combination Tool operates on direct current. Drilling capacity in steel up to ½" diameter. Emery wheel 6"x⅝".

MADE ESPECIALLY FOR MARINE SERVICE

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"Having a PULL means having a friend in power who will act as a steam windlass for you." The

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STEAM WINDLASS

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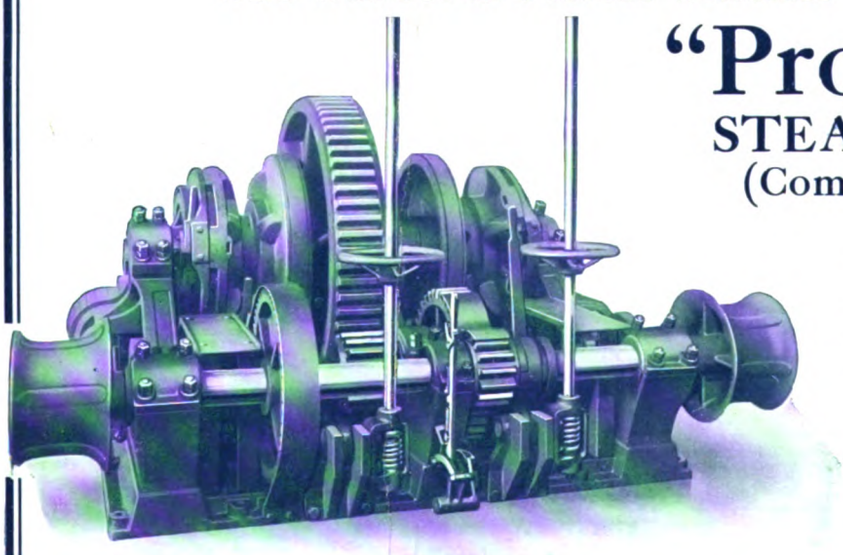

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AMERICAN ENGINEERING COMPANY

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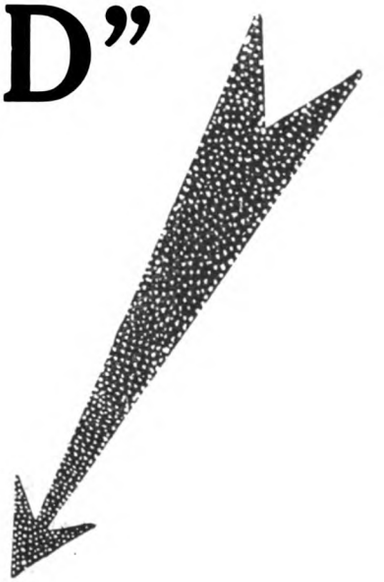

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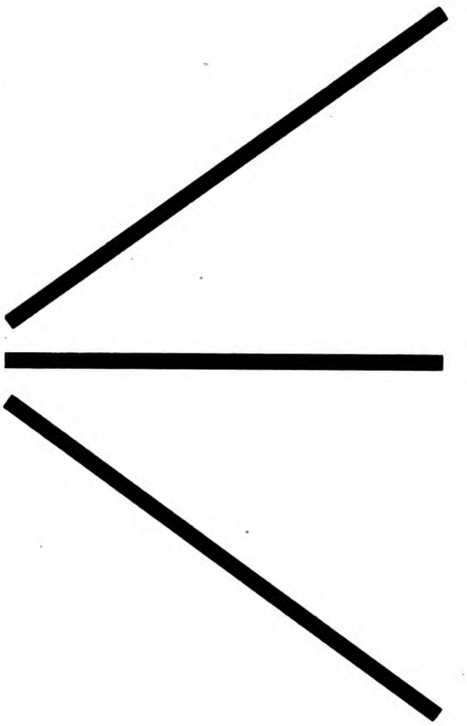

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4 Fairlie Place

Please address reply to
Managing Agents
General Dept.
POST BOX No. 157

CALCUTTA, 13th October, 1915.

REFERENCE No. M. 7126

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KILBURN & COMPANY
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